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Increased Pig Iron Business

Pig Iron Prices Slightly Lower—Good Export Trade in Iron and Steel

The pig iron situation appears to be of chief interest this week. Unquestionably the volume of business has considerably increased; but, of course, at the expense of values. The June total of pig iron sales by New York houses will be close to the largest, and with some sellers the largest, for any month so far this year. Philadelphia reports the purchase of 15,000 to 20,000 tons of basic pig iron and several large lots of foundry iron. Sales of fairly large quantities of both Northern and Southern foundry iron have been made in Pittsburgh, and a local consumer is negotiating for 15,000 tons or more of basic iron for delivery during the year. Western trade centers report somewhat more activity in pig iron, but no large transactions are specified.

A feature of current pig iron business is that the placing of orders is so consecutive, with no very large volume of inquiry before the trade at one time, that the extent of the bookings has not been appreciated. At present quite a number of inquiries are out for considerable quantities of various grades, but some of these are tentative and not likely to be placed immediately unless further important concessions in prices are secured. There has been no price reduction of consequence during the week, as values have receded so close to cost of production that further lowering is likely to come in concessions of 25 cents per ton or less. It is stated that this gradual shading has now brought No. 2 Southern foundry perilously close to $11, Birmingham, for third quarter delivery.

The rail sales of the week have been light. The New York, New Haven & Hartford bought 2000 tons, the New Orleans, Mobile & Chicago, 550 tons, and a Western railroad bought 1500 tons of Bessemer rails at Chicago, while an Eastern road increased its season contract 2000 tons. About 15,000 tons is in the market from railroads in Texas. Some foreign demand is noted, but not so heavy as reported in some of the daily papers. A Mexican road has bought 5000 tons and the Havana Central 5000 tons, while about 35,000 tons is in the market for Chile, which may be secured by American makers, and an inquiry from Mexico calls for 20,000 tons.

Not much credence is given in the iron trade to the current reports relative to a policy of retrenchment becoming general among the railroads. Steel companies having important railroad contracts state that instead of receiving any cancellations or requests for deferred deliveries they are urged to make more prompt shipments. The railroad companies, like other consumers, are, of course, desirous of securing the best terms possible and will, therefore, be somewhat cautious in entering upon new projects, but it is known that much

work will be coming from this direction as soon as iron market conditions are regarded as satisfactory.

It is interesting to note that the general foreign demand for American products is good and prices are well maintained. The exports of the United States Steel Corporation have shown a considerable increase over the corresponding period of last year. The United States Steel Products Export Company has secured the contract for a railroad bridge over the Yalu River between Korea and Manchuria, requiring 5800 tons.

In structural work the month of June shows nearly as large a volume of business as May. Some fabricators, in fact, have taken a larger tonnage this month than last. This flow of business, however, is not likely to be maintained, as new orders have latterly not been sufficiently heavy to offset deliveries on contracts.

Those sheet and tin plate mills which operate under the rules of the Amalgamated Association reached an agreement last week on the scale of wages to run for the year beginning July 1. The workmen originally demanded 10 per cent. advance on the past year's scale and then reduced the demand to 5 per cent., but the manufacturers resolutely refused any advance and the men finally agreed to accept the old scale. Harmony thus prevails in these branches of trade, which have been among the most active this year.

Sunday Labor at Blast Furnaces

The committee of the American Iron and Steel Institute which is to investigate the question of Sunday labor at iron and steel works admittedly has a difficult problem to solve in dealing with the operation of blast furnaces. The paper of Wm. B. Dickson, which led to the appointment of the committee, referred to the continous processes as involving seven-day labor which had commonly been considered unavoidable. It did not advocate a cessation of Sunday work at blast furnaces. That matter was evidently left by the author to be made part of the general inquiry. What was specifically asked for was such an adjustment of the work involved in the continuous operations as will give to all workers engaged in them a six-day week instead of the seven-day week.

It is so many years since there were regular Sunday shutdowns at any of the blast furnaces in the United States that such a procedure has not had serious attention until the present discussion. In the Hanging Rock district of Ohio were a few furnaces, in the days of small open top stacks, whose owners kept blast off from Saturday midnight to Sunday midnight. There were a few other cases in which furnaces were banked from 6 a.m. to 6 p.m. on Sunday. As the capacity of blast furnaces has grown, and with the growth in size has come greater loss from shutdowns and greater difficulty in getting back to normal product after such intervals, the practice of seven-day labor, with two regular shifts, has become universal.

The Scotch custom in Sunday observance at blast furnaces was to shut down at 6 a.m. and start at 6 p.m. Many of the Scotch furnaces use raw coal as fuel, and after the saving of by-products was the practice at such furnaces there were serious accidents on starting up Sunday evening, so that the shutdown was abandoned. Whether any considerable number of blast furnace companies in the United States would agree to a shut down for 12 hours on Sunday is a question. Where consideration has been given to such a proposal, one point urged has been that such an interval would eliminate the 24-hour day that now comes for half the workers in the changing of shifts on Sunday from night to day and vice versa. In shutting down from 6 a.m. to 6 p.m. the men leaving the furnaces at 6 a.m. would not report again until 6 a.m. Monday, and those coming on Sunday night would have been off duty from 6 p.m. Saturday.

It is to be considered that ordinarily it requires longer to get a furnace back to normal working than the time for which blast has been off—twice as long in many cases. The pumping of water is also an important item of expense. This would require that for a modern furnace 250 hp. of boilers would need to be fitted to burn coal economically; in other words, boilers other than those equipped to burn gas.

The suggestion has been made that furnaces equipped with dry blast apparatus would be able to attain regular working much more promptly after a Sunday shutdown than furnaces blowing natural air. The record of experience on this point is not voluminous, but observations indicate that it is worth further testing. At one furnace having dry air it is reported that after a stop of a week it is possible to get into the notch at the bottom, and that the iron is soft on starting up. This contrasts with frequent experiences with natural air, in which even after a short shutdown it was necessary to go up quite a distance to get the notch, and there was always considerable hard iron.

The questions of economical practice involved in any proposal to reduce Sunday output at blast furnaces thus appear to be of no small moment. On the other hand, any scheme that contemplates continuous operation through the increase of working forces would mean that even then only a minority of the men would have Sunday as their day off. The question really resolves itself in the end to that of the price the pig iron producers of the country shall be called on to pay to insure the six-day week to their employees and in what form it shall be paid. So far as the proposal for an eight-hour day and three shifts is concerned, which the Central Western blast furnace workers asked for several years ago, that could not be considered at present as a part of the Sunday labor problem. It is a much broader question, involving two things not attainable at once, if at all—a 50 per cent. increase in labor cost and a 50 per cent. increase in the supply of blast furnace workers.

The Canadian View of Reciprocity

The negotiations for reciprocity with Canada which are to be undertaken in the fall are likely to be attended with complications. Notwithstanding the fact that the Canadian Government has indicated a disposition to enter upon such negotiations with a reasonable spirit, it appears evident that much opposition will be encountered among manufacturers and other strong supporters of Canada's protective policy.

The subject was taken up for consideration at the annual meeting of the Montreal branch of the Canadian Manufacturers' Association on June 22, and William Cauldwell, the retiring president, made a strong address in opposition. He stated that the existing United States tariff is 25 per cent. higher than Can-

ada's general tariff, comparing the two with reference to dutiable goods. He claimed that if the United States is sincere in its desire for closer trade relations it should begin by placing goods entering this country on as advantageous a footing as that on which American goods entering Canada now stand. Proceeding, he stated that Canada's moderate protective tariff has been good for the country, its fostering of home manufacturing industry being highly beneficial to wage earners, to the farmers for whom it has made a domestic market and to the country as a whole which it has helped to develop. He credited it with bringing prosperity to Canada, and hence asked why should financial and other interests be disturbed by tariff tinkering to please the United States.

A most influential group of Canadian citizens is composed of those interested in iron and steel production. At the recent annual meeting of the Dominion Iron & Steel Company, held in Montreal, the president, J. H. Plummer, referred to the approaching termination of the bounties on iron and steel, and stated that, to make up for the discontinuance of this public aid to the iron and steel industry, the Canadian Government, he had reason to believe, would increase the protection on iron and steel at the next session of Parliament. This indicates that efforts are now being made to secure a favorable sentiment toward legislation of this sort.

It is, of course, possible that considerations of this character may have less weight with the Canadian Government than the general conditions prevailing among the people of the country. Undoubtedly a strong feeling obtains among various consuming interests for closer trade relations with the United States. Our Canadian correspondent states that among consumers the general belief is that the Government will be willing to give the United States more favorable tariff treatment in respect to iron and steel if this country will give equivalent concessions. The foundry interests in Canada are not satisfied with present tariff conditions. They are obliged to pay the full duty on the pig iron they import, and they do not have a large margin of protection. If the duty on pig iron were proving effective as a stimulus to an adequate domestic supply of such crude material, there would be less dissatisfaction. As it is, the bulk of the pig iron required for foundry use has to be imported, the pig iron output of the principal furnaces in the country being used for the manufacture of steel. It is also claimed that farmers would not support an arrangement substituting an increase in the iron and steel duties for the bounties that are to disappear in deference to agricultural opinion. There would be very strong popular opposition to a measure for adding to existing duties on iron and steel. Articles that are now free, such as wire rods, might, however, be made dutiable at a moderate rate. If so, there would likely be compensatory duties on the manufactured products of such material.

Still another consideration is likely to crop up which may have an important bearing on the reciprocity negotiations. This is the strong disposition among Canadian business men to maintain as close relations with Great Britain as possible. The Canadians are loyal to the mother country, and are therefore generally averse to taking any step which would seem to weaken the bond between Great Britain and Canada. The fact must not be overlooked that Great Britain is the most important market for Canada's various products. In the past 10 years the British market took 51 per cent. of Canada's total exports, while the United States in the same time took but 36 per cent. On the other hand, Canada drew only 24 per cent. of its total imports from Great Britain, while it drew from the United States 61 per cent. Undoubtedly a reciprocity arrangement would still further increase this preponderance of trade in favor of the United States.

The Open Door

There are two distinctly contrasting traits of human nature which have a great deal to do with progress, be it political or commercial; one of these acts negatively, the other positively. The first is that peculiarity in the make-up of all of us which so narrows the field of mental vision that we see good in those things only which intrench us in our present position. Following the impulses of this force within us, we jealously guard our work from curious eyes; we close our doors; we assume a mask of ignorance lest inadvertently we let slip some inkling of how much we know.

We are all familiar with the type of man who has formed the habit of "sewing up" his work. He has little or no tangible system and leaves no trail behind him in the shape of records as to what he did or how he did it. When he takes his vacation, or is absent from illness, the work accumulates until he returns, which is supposed to prove to his employers how impossible it would be to get along without him. We have seen, too, factories in which the doors of all the rooms were locked and it was necessary to practically give a pass-word to enter one of them.

Fortunately, the majority are growing more clear-sighted about these things and are beginning to realize that more is to be lost than gained by such secretive methods. The marked degree by which every one has profited with the increase and extension of facilities for transporting both intelligence and materials should be all the proof necessary for the abandonment of practices resulting from impulses arising from the regrettable feature of our make-up.

This brings us to the other trait, the one that makes for progress; the trait of doing a thing openly, above board, and without thought of self, unless it be to feel, perhaps, the thrill and glow that come at the end of a day's work well done. It is the predominence of this spirit that is carrying us forward to-day. There are some who will deny that progress is due to the righteous motives we have just mentioned; their plea is to the effect that since necessity is the mother of invention, and since money supplies our necessities, therefore the pursuit of the almighty dollar lies at the bottom of all great works of to-day. Without doubt the bitterness which would call forth the statement of such a belief is in itself punishment enough for uttering it.

Under the impulse of this generous spirit, the man of to-day freely gives information to those who come seeking it, because he knows that in some way the law of compensation will repay him twofold. So, too, he studies to simplify his present duties and to organize his office so that the work will proceed automatically. Why? Because then he will not be needed any longer in that capacity and may move on to greater things.

We cannot bring ourselves to believe that the great commercial and industrial establishments of to-day were conceived and built up to their present splendid efficiency solely because of sordid motives. Our faith in the world, in its stability, will not allow us to believe the souls of our great men to be made of the "shoddy" which such an admission would indicate. For our own peace of mind we must always hope and avow that each new machine developed, each new book published, each step forward taken by the nation has not been done simply for the money that was in it, but rather by the prompting, by the irresistible impulse of a finer instinct, a trait which half of us may not know we possess, but which all of us obey much more often than we think.

The Owner and the Fellow Workman

A new and apparently reasonable principle which will assist in clarifying the perplexing subject of workmen's accident compensation has been established in Great Britain under a recent decision of the courts. It has been determined that an owner, after paying damages to an injured employee, may recover such damages from a fellow workman shown to have been responsible for the accident. In the case at issue a boy who was cleaning a machine at the order of one fellow workman was injured because the mechanism, which should have been at rest during the task, was started up by the order of a second fellow workman. The owner was compelled, under the act, to pay compensation to the boy. He then brought action against the victim's two fellow workmen and recovered under the section of the statute which says that "if the workman has recovered compensation, the person by whom the compensation was paid and any person who has been called upon to pay an indemnity shall be entitled to be indemnified by the person liable to pay damages."

Under the favorable decision of the courts, the case having been carried up from the original tribunal to the court of last resort, a precedent is established which is considered in England to be of the highest importance, in that it construes the section to apply to a fellow servant who has been guilty of negligence. The safeguard of the owner under employers' liability acts of most countries, and under the common law, that the employer shall not be liable because of an accident resulting from the negligence of a fellow servant, is now turned to another form of defense under workmen's compensation. In the one instance, the accident victim cannot recover when the blame for his injuries rests upon a fellow servant. In the other, while the injured man is entitled to damages from his employer, the latter may in turn obtain compensation from the person upon whom rests the blame. The ruling will be of especial importance where accidents occur through the fault of foremen and others in authority.

The New York Central Railroad is to resume work at once on the construction of its extensive gravity yards at Gardenville, near Buffalo, work on which has been at a standstill for about a year, pending the securing of permission from the Public Service Commission to make certain changes in grades and in the building of viaducts. About one-quarter of the work is completed, and the remainder will be finished within a year. The total expenditure involved is about $2,000,000.

The Lock Bar Steel Pipe Patent Suit

The suit in the Court of Chancery of New Jersey involving the ownership of certain inventions and patents relating to the manufacture of lock bar steel pipe, and asking to enjoin and restrain the defendants from the manufacture of lock bar pipe, brought by the East Jersey Pipe Company against John Fraser of Hackensack, Thomas Gray of Paterson, and the Fraser Lock Bar Pipe Company, at 50 Church street, New York City, was dismissed June 22 by order of Vice-Counsellor Garrison at the request of Griggs, Baldwin & Baldwin, attorneys for the complainant, and on payment of costs to the defendants. Dismissal was agreed to by Raymond Dawson, attorney for defendants, only after agreement by complainant's attorneys that, as there had been no proper grounds or cause for action, there would be no reinstatement or recurrence of this case in any form.

John Fraser, the principal defendant, was for some time general manager of the complainant company, which is owned principally by the T. A. Gillespie Company, but the inventions in dispute were neither thought of nor developed until after his connection with that company ceased. The Fraser Lock Bar Pipe Company will now proceed to develop its plans and erect works for the manufacture of lock bar pipe under its own patents as rapidly as is feasible, but as the plant will be quite an extensive one it will be some time before its pipe is on the market.

American Iron and Steel Institute Committees

A meeting of the directors of the American Iron and Steel Institute was held in New York Friday, June 24. The Committee on Improvement in Methods was increased from five to nine members and now consists of the following: E. H. Gary, chairman; J. A. Campbell, Youngstown Sheet & Tube Company; E. A. S. Clarke, Lackawanna Steel Company; E. C. Felton, Pennsylvania Steel Company; Willis L. King, Jones & Laughlin Steel Company; Samuel Mather, Pickands, Mather & Co.; W. A. Rogers, Rogers, Brown & Co.; Charles M. Schwab, Bethlehem Steel Company; John A. Topping, Republic Iron & Steel Company.

The make up of the Committee on Foreign Relations, provided for by the by-laws, was discussed, and J. A. Farrell, president of the United States Steel Products Export Company, was named for such committee, he to suggest the names of three others. Judge Gary (ex-officio) would also be a member of this committee.

E. A. S. Clarke was made chairman of a special committee to prepare for the fall meeting of the Institute, to which representatives of European steel industries will be invited, and was empowered to choose two others to act with him.

The question of selecting a permanent secretary or manager of the Institute was referred to a committee consisting of E. A. S. Clarke, John A. Topping and Willis L. King.

The Los Angeles Steel & Malleable Iron Company, Los Angeles, Cal., has acquired options on a 20-acre tract near the Long Beach shipyards, upon which it is considering the erection of a plant for the manufacture of a rail locking device. Plans are now being prepared for a reinforced concrete factory building, which when completed will be equipped with machinery to a rated initial capacity of 50 tons of finished product daily. It is expected that construction work will begin early in the fall. The company, which was incorporated in April with a capital stock of $1,000,000, has offices in the Delta Building, Los Angeles. J. W. Ashley is treasurer.

Bailey Combination Sheet and Pair Furnace Orders

The Canton Sheet Steel Company of Canton, Ohio, will erect an eight hot mill sheet plant, and has placed with George J. Hagan, furnace engineer and contractor of Pittsburgh, contracts for the building of eight sheet and pair furnaces, five annealing furnaces, chargers, three standard gas producers, overhead fuel connections and stokers for the sheet and pair furnaces. The sheet and pair furnaces are of the Bailey combination stoker-fired type, of which Mr. Hagan is the sole licensee. These are the same type as installed by the Youngstown Sheet & Tube Company, Whittaker-Glessner Company, the American Rolling Mill Company, and others. The Berger Mfg. Company of Canton, Ohio, has placed a second contract with Mr. Hagan for six sheet and pair furnaces of the Bailey combination type. This order was placed following a series of tests, which are stated to have proved for this type of furnace a saving in fuel cost of approximately 40 per cent. A rush contract has been received by Mr. Hagan from the Union Switch & Signal Company, Swissvale, Pa., covering the installation of two cupolas, the dimensions of which are 72 and 66 ft. The erection of the furnaces constituting the addition to the Phillips Sheet & Tin Plate Company's plant at Weirton, W. Va., the work of which is in the hands of Mr. Hagan, commenced June 20. Record time is anticipated on this construction work, the estimated time being about five or six weeks. With the removal of certain machinery and construction of six tinning pots at the plant of the McKeesport Sheet & Tin Plate Company, the contract between this company and Geo. J. Hagan will have been completed. This contract, amounting close to $100,000, was carried out within a period of seven months.

To Secure Industrial Works for Titusville, Pa.—The Board of Trade of Titusville, Pa., organized recently with a membership of about 200, has created a fund which will be used to secure additional manufacturing industries for the town. John T. Dillon, president of the Titusville Forge Company, is president of the Board of Trade, and C. L. Gibbs, now located in the City Hall, is secretary. Mr. Hall says that, considering its size, Titusville is one of the wealthiest cities in the world. Several hundred acres of land are available for manufacturing purposes. It has the Pennsylvania and the Lake Shore Railroads, and its industries are supplied with cheap oil and gas. The principal products of the local industries are tool steel, radiators, forgings, cutlery, boilers and steam and gas engines.

The Norton Car & Foundry Company, Norton, Va., has increased its capital stock from $15,000 to $40,000 and has purchased a lot adjoining its present site, on which will be erected a brick foundry and machine shop. The old plant will be kept in operation until the new one is completed. The company will build mine cars and do general repair work, including the rebuilding of industrial locomotives. It is in the market for a combination power punch and shear, with 20-in. depth of throat, to shear 5/8-in. sheet steel or punch 1-in. hole in 5/8-in. bar, either belt driven or steam driven; one set of sheet metal rolls that will roll metal 8 ft. wide by 1/2 in. thick; one medium sized steam hammer; one 72 in. by 8 ft. rigid lathe; one shaper, with 20 to 24-in. stroke; one 36-in. rigid radial drill; one No. 2 Cincinnati or Brown & Sharpe milling machine; one 16-in. tool room lathe, and one 40 to 50-ton second-hand locomotive. W. M. Currier is president and S. C. Bateman general manager.

The plant of the Pennsylvania Swedish Iron Company at Cheswick, Pa., has been purchased by H. J. Koontz, Century Building, Pittsburgh, and the building and equipment is being offered for sale by the purchaser either as a whole or in part. The building is an all-steel structure 80 x 120 ft., erected five years ago.

S. A. E. Specifications for Automobile Materials

The Society of Automobile Engineers, 1451 Broadway, New York City, has completed the preparation of, and will issue shortly to its members exclusively, the most complete list of material specifications ever made for motor car engineering work. The motor car business has been largely responsible for the great development of certain materials, particularly alloy steels and other metals. The list to be published is of materials whose qualities have been thoroughly demonstrated for motor car uses. These materials are practical in that they can be purchased readily, can be worked economically, and are in every respect suited to withstand the severe service to which they are subjected in a motor car.

The specifications were prepared under the advice of Henry Souther, metallurgist, and are accompanied by complete notes and instructions on the method of purchasing, inspecting and handling the materials used in motor car construction, in what condition they should be ordered and how they should be treated before and after being worked into finished parts. The work covers such materials as low and high carbon steels, carbon spring steel, screw stock, low and high carbon nickel steel, chrome nickel steel, chrome vanadium steel, chrome vanadium spring steel, silicon spring steel, alloy steel for pressed frames, valve metals, steel castings, gray iron castings, malleable iron, babbit metals, white brass, phosphor bronze bearing metal, valve bronze, yellow brass, aluminum alloys and automobile engine lubricating oil. There are discussed specific materials suitable for seamless tubing, pressed steel brakedrums, sheet steel brakebands, and pressed steel parts of many varieties, forgings, axles, structural parts of any importance, steering arms, steering spindles, levers, connecting rods, crankshafts, main driving gears, nuts, screws, steering connection pins, rocker arm pins, parts called upon to resist wear, but not bending strains or severe shocks, propeller shafts, drive shafts, connecting rod bolts, transmission gears, leaf and spiral springs, crank cases, gear cases and many other parts. Much space is given to the heat treatment of steels.

The American Motor Castings Company, Detroit, Mich., has just completed the main building of a new plant, 130 x 130 ft., three stories, of brick and steel construction, the ground floor of which will be used for offices and stockrooms, the second floor for an aluminum foundry and the third a machine shop. The building has two wings, one of which is one story, 80 x 300 ft., for foundry purposes, and the other, 70 x 150 ft., is used as a coreroom. There is also a two-story cupola house, 40 x 40 ft., and a cleaning room, 70 x 150 ft. Practically all of the equipment required has been purchased and the foundry is now in operation. The entire plant, including buildings and equipment, represents an expenditure of $200,000.

The U. T. Hungerford Brass & Copper Company, New York, is actively pushing business in its various departments. The month of June has brought forth the completion of five departmental catalogues, with another almost ready to go to press. Those already out are as follows: Valves; brass fittings for plumbing, steam fitting, automobiles, motor boats, &c.; priming cups, oil and grease cups, lubricators, spark plugs, &c.; tubular, bevel clinch and open prong rivets, caps and staples; U. S. ammunition. The catalogue on bath supplies will probably be ready in July.

American Society for Testing Materials

ATLANTIC CITY, N. J., June 28, 1910.—The thirteenth annual meeting of the American Society for Testing Materials opened at the Hotel Traymore, Atlantic City, this afternoon, and was presided over by Robert W. Lesley, Philadelphia, vice-president. A registration of about 125 was reached to-day, and this will be considerably increased to-morrow.

Business Session

The annual report of the Executive Committee was presented in printed form, and various recommendations of changes in the society's regulations were acted upon. One that led to some discussion was the proposal to permit any committee of the society to select a producer as chairman provided he received a three-fourths vote. Heretofore, it has been the rule that chairmen be selected from consuming interests or unattached experts. It was the sense of those present, by a vote of more than 2 to 1, that no change be made in the rule of the society on this matter, but the matter will later be submitted to letter ballot. In the discussion of the question Mr. Lesley referred to the fact that the most universally adopted specification of the society, that on cement, was formulated by a committee on which there were 20 engineers and only 10 producers. To this it was replied that the cast iron pipe specification of the society, with the making of which manufacturing interests had much to do, had been adopted by the American Water Works Association, and was also concurred in by the very conservative English manufacturers of water and gas pipe.

Other changes in the society's regulations which were voted on at the meeting and that will now go to ballot were an increase in the Executive Committee membership to 11, increasing dues to $10 a year and creating a junior membership, those under 30 years of age, to whom dues will be $5.

The election of officers resulted in the choice of the following:

President, Henry M. Howe.
Vice-President, Robert W. Lesley.
Secretary and Treasurer, Edgar Marburg.
Member of Executive Committee, James Christie.

Specifications for Cast Iron

The report of Committee A-3 on Standard Specifications for Cast Iron and Finished Castings was presented by the chairman, Walter Wood. It reviewed the work done by the committee at the Copenhagen congress in conjunction with representatives of other countries. The specifications prepared by this committee are gradually finding favor abroad and it is hoped that by the next International Congress in 1912 uniform specifications for cast iron will have been reached that will justify the course pursued by the committee. Tests are to be made in various countries to arrive at tne proper length for the arbitration test bar advocated by the committee.

In a paper on "Tests on Cast Iron Arbitration Test Bars," by C. D. Mathews, which was read by title, following the presentation of Mr. Wood's report, the results of tests conducted at the Wood pipe foundry were presented. The writer thought that the 1¼ in. round bar, which is generally favored for the arbitration bar, should be 16 or 18 in. long, either of these lengths being preferable to a shorter or a longer bar. The paper showed that variations of about 5 per cent. in tensile strength and at least 10 per cent. in transverse strength are to be expected. Dr. Moldenke spoke of the effort to get an arbitration bar between the 6-in. bar of Italy and the 24-in. bar of Germany.

The papers of Thomas D. West on "Untruly and Unevenly Chilled Car Wheels," and of A. E. Outerbridge, Jr., on "Some Recent Tests of Cast Iron," were read by title.

Gaetano Lanza, chairman of Committee E-1 on Standard Methods of Testing, recommended that the report of the committee as submitted last year be sent to letter ballot and this was done.

Specifications for Steel Springs

Henry Souther, Hartford, Conn., chairman of Committee A-7 on Spring Steel, made a tentative report. The problem of the committee, he said, was to draw a set of specifications so that purchasers of springs might receive springs of proper quality chemically and physically; also to devise static and dynamic tests to determine the real worth of spring steel. The tests thus far made show that the modulus of elasticity of all steels used for springs, whether annealed or tempered, is the same—about 28,000,000 or 30,000,000; that there is a reasonably well defined elastic limit in spring steels; that carbon and alloy steels differ not as to resiliency or stiffness, but as to elastic limit; that alloy steels hardened and tempered under suitable treatment have higher elastic limits than carbon steels, and are therefore better for springs; that the alloy steel makes a better spring because its endurance is greater. Some data were given concerning various alloy steels used for high grade springs, particularly those containing chromium and vanadium and the so-called silico-manganese steel. Mr. Souther expressed the opinion that the methods of the spring maker cannot be controlled, and that the quality of the spring must be judged by its behavior under test and not by the treatment any manufacturer may give it. A complete series of tests will be necessary to determine safe minimum and maximum limits for any given analysis of spring steel. It was suggested in conclusion that the Brinell hardness test may furnish a means of inspecting and testing springs, as this test may be applied to a finished spring without injury.

Fluxes for Bronze Alloys and Iron Castings.—To thoroughly demonstrate the advantages of Radioclarite and the Keystone Thermo Flux the Basic Mineral Company, N. S., Pittsburgh, Pa., is offering to send free of charge samples of either or both of these fluxes, so that the merits may be judged by actual trials. Radioclarite is designed for making all alloys in metal. Some of the advantages claimed for this flux are that it will clean dirty sweepings and melt them into bronze suitable for the best castings, will make good castings from turnings without the use of the magnetic separator, and is a very good cleaner and user of scrap. Keystone Thermo Flux is suitable for making all kinds of castings, but is particularly adapted for making radiator, boiler, automobile, engine and compressor castings. It is said that the iron where it is used will be tough, clean and neutral, and will deflect twice as much without breaking as ordinary castings. The use of either of these fluxes in the foundry is said to cause no change in the method of operation.

The New England Iron and Hardware Association held its annual meeting at Young's Hotel, Boston, June 21. The following officers were elected: President, Edward A. Loomis, Belcher & Loomis Hardware Company, Providence, R. I.; vice-president, Fred L. Greeley, Herrick Company, Boston; treasurer, Chas. H. Breck; clerk, Geo. J. Mulhall; directors—Chas. A. Adams, R. H. Boutwell, C. F. Bragg, W. H. Dunning, Geo. M. Gray, F. L. Greeley, C. W. Henderson, E. A. Loomis, A. B. Marble, F. A. Marvin, W. B. Willcutt. Reports of various committees were read, and the treasurer's report showed a good financial condition. President-elect Loomis has been prominent in association work for years.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	June29, 1910.	June22, 1910.	May25, 1910.	June30, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.25*	$16.50	$17.00	$16.50
Foundry No. 2, Southern, Cincinnati	14.75	14.75	14.75	15.25
Foundry No. 2, local, Chicago	*16.75*	16.75	17.00	16.50
Basic, delivered, eastern Pa.	*15.75*	16.00	16.25	15.50
Basic, Valley furnace	*14.50*	14.50	15.00	15.00
Bessemer, Pittsburgh	*16.40*	16.40	16.90	16.15
Gray forge, Pittsburgh	*14.90*	14.90	15.90	14.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*25.00*	25.00	25.50	23.00
Forging billets, Pittsburgh	31.00	31.00	31.00	27.00
Open hearth billets, Philadelphia	*28.50*	28.50	29.00	25.00
Wire rods, Pittsburgh	*31.00*	31.00	32.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*13.50*	14.00	15.00	14.50
Steel rails, melting, Philadelphia	*14.25*	14.50	14.50	16.00
Iron rails, Chicago	*17.00*	17.00	17.50	17.00
Iron rails, Philadelphia	*19.50*	19.50	20.00	19.50
Car wheels, Chicago	15.50	15.50	15.50	16.00
Car wheels, Philadelphia	*14.50*	15.00	15.00	15.25
Heavy steel scrap, Pittsburgh	*15.00*	15.00	15.25	16.00
Heavy steel scrap, Chicago	*12.75*	13.00	13.50	14.50
Heavy steel scrap, Philadelphia	*14.25*	14.50	14.50	16.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.47½*	1.47½	1.52½	1.45
Common iron bars, Chicago	*1.45*	1.45	1.47½	1.35
Common iron bars, Pittsburgh	*1.50*	1.50	1.55	1.45
Steel bars, tidewater, New York	1.61	1.61	1.61	1.41
Steel bars, Pittsburgh	1.45	1.45	1.45	1.25
Tank plates, tidewater, New York	*1.61*	1.61	1.66	1.46
Tank plates, Pittsburgh	*1.45*	1.45	1.50	1.30
Beams, tidewater, New York	*1.61*	1.61	1.66	1.46
Beams, Pittsburgh	*1.45*	1.45	1.50	1.30
Angles, tidewater, New York	*1.61*	1.61	1.66	1.46
Angles, Pittsburgh	*1.45*	1.45	1.50	1.30
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.40
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.20
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.70
Cut nails, Pittsburgh	*1.75*	1.75	1.80	1.65
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	12.75	13.00	13.37½
Electrolytic copper, New York	*12.37½*	12.50	12.87½	13.12½
Spelter, New York	*5.20*	5.15	5.30	5.35
Spelter, St. Louis	*5.05*	5.00	5.15	5.27½
Lead, New York	4.37½	4.37½	4.37½	4.35
Lead, St. Louis	4.22½	4.22½	4.22½	4.30
Tin, New York	*33.00*	32.60	33.25	29.15
Antimony, Hallett, New York	8.12½	8.12½	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.45c. to 1.50c., net; I-beams over 15 in., 1.60c., net; H-beams over 8 in., 1.70c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.55c., net; angles over 6 in., 1.00c., net; angles, 3 x 3 in., and up, less than ¼ in., 1.70c., base, half extras, steel bar card; tees, 3 in. and up, 1.60c., net; zees, 3 in. and up, 1.55c., net; angles, channels and tees, under 3 in., 1.45c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.45c. to 1.50c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
⅛ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $31.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50 cents. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of $2 to $3 a ton to the small trade.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, June 29, 1910.—(*By Telegraph.*)

Pig Iron.—The local interest that has been in the market for a week or more for about 8000 tons of Northern foundry and 5000 tons of Southern has not yet closed for the Southern, but has bought a part of the Northern, probably 3000 to 4000 tons, on the basis of $14.35, $14.40 and up to $14.50, Valley furnace, for No. 2 foundry, for delivery in third quarter. This buyer is expected to close for more Northern foundry and about 5000 tons of Southern within the next week. Another local interest has been figuring on buying upward of 15,000 tons of basic iron for delivery over the next year, beginning July, but this business has not yet been closed. There is not much inquiry for Bessemer or basic, but the tone of the market is possibly a little firmer. On standard Bessemer iron most sellers quote $15.75 for third quarter and about $14.75 for basic for third quarter, but small lots of Bessemer can probably be picked up from dealers at $15.50 to $15.60, and small lots of basic as low as $14.50. We quote standard Bessemer iron at $15.50 to $15.75; malleable Bessemer, $15 to $15.25; basic, $14.50 to $14.75; No. 2 foundry, $14.50 and gray forge, $14, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—No new sales of Bessemer or open hearth billets or sheet bars of any magnitude have been reported in the past week. The consumption of steel among finishing mills in July will be lighter than for some time, as quite a few concerns will close down June 30 for inventory and repairs. We quote Bessemer billets at $25 to $25.50 and sheet bars, $26.50 to $27; 4 x 4 in. open hearth billets, $28 to $28.50; open hearth, small billets, $29 to $29.50; open hearth sheet and tin bars, $28.50 to $29, and forging billets, $31 to $32, all f.o.b. Pittsburgh, freight to destination added.

Iron and Steel Scrap.—There has been a little more inquiry in the last few days, and some sales have been made. A local dealer reports a sale of about 2000 tons of low phosphorus melting scrap at about $19, Pittsburgh, and we also note sales of about 1500 tons of heavy steel scrap for open hearth furnace use at $15, for delivery in the Sharon and Steubenville districts. We also note a sale of 500 tons of borings at $8.75, delivered Brackenridge, Pa.

(*By Mail.*)

The settlement of the wage scale for another year from July 1 between the independent sheet and tin plate mills that sign the scale and the Amalgamated Association, is about the only item of interest in an otherwise very quiet week. The sheet and tin plate employees originally asked for an advance of 10 per cent., but at the meeting held last week agreed to accept 5 per cent. The operators refused absolutely to grant any advance and the men finally agreed to accept the old scale for another year and which expires on June 30. Today (Tuesday) a conference is being held between wage committees of the Western Bar Iron Association and the Amalgamated Association at Detroit, and it is possible that a settlement of the puddling and finishing scales will be reached at this conference. A number of the finishing mills in the Central West will close down on the night of June 30 for periods ranging from 10 days to several weeks to allow repairs to be made and stock taking. The general situation in the iron trade continues very quiet, and it is the opinion that it will continue so during July at least and possibly all through August. Consumers have no incentive to anticipate their needs, as they regard future prices rather uncertain, and new buying is confined largely to orders for actual needs. The mills are pretty well filled up with contracts, and while specifications against these have been coming in at a fairly satisfactory rate, it is not unlikely they will show a material falling off in July, as a good many concerns that are large consumers of material will be shut down. A leading local interest closed late last week for a fairly large tonnage of Northern and Southern foundry iron, the Northern going at about $14.50 at Valley furnace for third quarter and the Southern about $11.50, Birmingham, for the same delivery. Another prominent local consumer is still in the market for 15,000 tons or more of basic iron for delivery over the year, beginning July 1, but the business has not yet been closed. Low prices have been made on this inquiry for the second half of this year, but for first half of next year the furnaces want more money. Prices on Bessemer steel continue weak, with reports that $25, Pittsburgh, has been slightly shaded on 4 x 4 in. Bessemer billets. It is probable new orders and specifications against contracts on finished iron and steel in July will show a falling off as compared with June, but this is expected. The coke trade continues quiet, with no special change in prices, while the scrap trade is also dull and prices are weak.

Ferromanganese.—There is very little new inquiry and prices continue weak. Most consumers are covered for the balance of this year, and only an occasional small lot for prompt delivery is being sold. We quote foreign 80 per cent. ferro for delivery over balance of this year at $39 to $39.50, Baltimore, carrying a freight rate of $1.90 a ton for delivery in Pittsburgh district.

Ferrosilicon.—New demand is very dull, most consumers being covered for the next three or four months. A steel casting concern has bought about 30 tons of 50 per cent. for July delivery on the basis of about $57.50, Pittsburgh. The market is weak, and we continue to quote 50 per cent. ferrosilicon at $57.50 to $58, delivered Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—There is some inquiry for Bessemer rods, but prices are weak and slightly lower. A sale of 300 tons of Bessemer rods for early shipment is reported on the basis of about $30, Pittsburgh. We quote Bessemer and chain rods at $30 to $31, and open hearth rods at $31 to $32, Pittsburgh.

Skelp.—The heavy orders for iron and steel sheared plates placed with the mills recently by pipe concerns that have taken large contracts for oil and gas lines have filled these mills up for the next two or three months. Specifications against these contracts are now coming in very freely. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—New orders for light rails were not quite as active last week as they have been, but the Carnegie Steel Company entered new orders for about 3000 tons and also received fair specifications against contracts. The company also entered some orders for standard sections, and is receiving right along some good business in rails for foreign shipment. Demand for track supplies is active, and the Carnegie Steel Company is pretty well filled up for some time ahead. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—There is a decidedly better tone to the market, but, following the rush of heavy contracts noted in this report last week as having been taken by the American Bridge Company and the McClintic-Marshall Construction Company, new business placed in the last few days has been light. June was the heaviest month in orders booked that the American Bridge Company has had in a long time, the concern having taken fully 75,000 tons or more of new work, and the McClintic-Marshall Construction Company, including the Panama lock gates contract, requiring 59,000 tons, also had the best month it has had in a long time. The American Bridge Company has taken in the past week 3000 to 4000 tons of bridges and buildings for Western shipment, and has also closed several fairly large orders for Eastern delivery. The leading fabricators are well filled up for the next three or four months, and are now bidding only on desirable work. We quote beams and channels up to 15-in. at 1.45c. to 1.50c., Pittsburgh.

Plates.—Local plate mills have received some heavy contracts in the past week or two, notably the Panama lock gates and the material for several oil and gas lines; the leading local plate mills are well filled up through the third quarter. New car orders have been scarce for the past two weeks, and inquiries out are light. The only notable new inquiry in the market is the Baltimore & Ohio Railroad for 4000 to 5000 steel and steel underframe cars; this contract may be placed this week. The New York Central Lines are said to be figuring on purchasing 6000 to 8000 cars and about 100 locomotives, but actual inquiries are not yet out. On the narrow sizes of plates some of the outside mills are naming as low as 1.40c., and on the wide sizes 1.45c. to 1.50c. is being quoted. We quote ¼-in. and heavier plates in narrow sizes at 1.40c. to 1.45c., and in the wider sizes at 1.45c. to 1.50c., Pittsburgh.

Sheets.—The wage scales of the independent sheet mills with the Amalgamated Association have been fixed up for another year beginning July 1, and the same scales will prevail for the coming year that are now in force, and which will expire on June 30. Some of the leading sheet mills will close down on that date for needed repairs and inventory, so that actual output of sheets in July will probably be lighter than in any one month this year. New demand for black and galvanized sheets in the lighter gauges has fallen off considerably, and some of the mills are making concessions in prices to get orders, these being about $2 to $3 a ton.

Tin Plate.—Output of tin plate in June was a record-

THE IRON AND METAL MARKETS

breaker; the American Sheet & Tin Plate Company, and leading independent mills, such as Pope Tin Plate Company, Phillips Sheet & Tin Plate Company, McKeesport Tin Plate Company and Standard Tin Plate Company, had the heaviest output in June they have had in any one previous month for a long time. Not much new business is being placed in tin plate at present, the buying season being over, but the leading tin plate mills are filled up with contracts taking practically their entire output for balance of this year, and consumers are specifying freely against these contracts. Consumers are more concerned now in getting deliveries on orders already placed than in placing new business. The market is very firm, and we continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—The mills rolling steel bars are so occupied with contracts, against which heavy specifications are being received, that they cannot take orders for reasonably prompt delivery. Specifications on contracts for soft steel bars for concrete work are very heavy and an enormous tonnage is being used for this purpose. New demand for iron bars is light, and a number of the mills will close down on June 30 for repairs and stock taking. The railroads have not been specifying freely on contracts for iron bars for delivery in the first half, and much of this tonnage will be carried over into the second half. We quote steel bars at 1.45c. and common iron bars at 1.50c. to 1.55c., Pittsburgh.

Hoops and Bands.—New orders lately have been rather light, and specifications against contracts are not being received as freely as some time ago. The continued weakness in soft Bessemer steel is also causing buyers to hold off placing orders except for actual needs. We quote steel hoops for forward delivery at 1.45c. to 1.50c., while for prompt shipment 1.60c. to 1.65c. is quoted. Steel bands are 1.40c. to 1.45c. on contracts for forward delivery, these carrying steel bar card extras.

Spelter.—The market continues dull and weak, demand being lighter than for some time. We quote prime grades of Western spelter at 4.95c., East St. Louis, but on a firm offer 4.90c. might be done.

Spikes.—Local makers of railroad spikes report new demand as quiet and mostly in small lots for repair work. On small railroad spikes and boat spikes demand is only fairly active. We quote standard sizes of railroad spikes, 4½ x 9-16 and larger, at 1.55c. to 1.60c. for Western shipment and 1.60c. to 1.65c. for local trade. Boat and small railroad spikes are also lower in price and we quote these at 1.65c. to 1.70c., base, these prices being for carload and larger lots.

Rivets.—New orders continue to be placed, mostly in small lots for actual needs, and specifications against contracts are not coming in as freely as some time ago. Some of the smaller makers continue to shade regular prices, which are 2.15c. for structural rivets and 2.25c. for boiler rivets, f.o.b. Pittsburgh.

Shafting.—Automobile builders have been heavy consumers of shafting for some months, and their demand continues active, although not as heavy as a while ago. Other consumers of shafting are placing orders at a fairly active rate, and the makers of shafting are well filled up for the several months, but are now catching up on back deliveries to some extent. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—Leading makers of wire products report that they are operating at present to about 15 per cent. less capacity than last year. The month of June was better than May in new orders and specifications, but the general condition of the wire trade is not nearly as satisfactory as it was expected to be at this time. It is believed that new orders and specifications against contracts in July will show some improvement over June. We quote wire nails at $1.80 in carload and larger lots; galvanized barb wire, $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; cut nails, $1.75 to $1.80, all f.o.b. cars, Pittsburgh, with usual terms, and freight to destination added.

Merchant Pipe.—The Republic Iron & Steel Company expected to start another lap weld furnace in its new pipe mill at Lansingville, Ohio, within the next few days, giving it two furnaces running on lap weld pipe up to 6 in. in diameter. No further large contracts for line pipe were placed last week, but some large projects are under way which may be given out in the near future. On lap weld sizes the leading pipe mills are well filled up for the rest of this year. New demand for butt weld sizes of pipe is very dull and has been for some time. It is stated that discounts on iron and steel pipe, printed on a previous page, are being well maintained.

Boiler Tubes.—Several heavy contracts for locomotive tubes have recently been placed by local mills, and other orders of this kind are now on the market and will likely be placed in a short time. New demand for merchant tubes is fairly active, but the mills could take care of more business if they had it. Regular discounts on locomotive and boiler tubes will be found on a previous page, but these continue to be shaded.

Coke.—Some fairly large inquiries for furnace and foundry coke for delivery over last half of the year are in the market, and one fairly heavy local consumer of foundry coke has closed for its entire supply for last half of the year on the basis of about $2.25 in net tons at oven. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of the year at $1.80 to $1.85, and best grades of 72-hour foundry coke at $2.15 up to $2.40 in net tons at oven for same delivery. Furnace coke loaded on cars which has to be moved is being offered at $1.65 to $1.70 for best grades. Output of coke has been materially restricted in the past month, the Upper and Lower Connellsville regions now turning out about 400,000 tons per week.

Iron and Steel Scrap.—The market on this material continues dull in demand, and prices on the whole are weak. A good many consumers of scrap will close down their plants on June 30 for repairs and inventory, and as a result less than the usual amount of scrap is moving from the dealers to consumers. The New York Central scrap list closes to-day (June 28), while the Pennsylvania Lines West closes on June 30. The bids made on these two lists are being awaited with interest, as they will give a pretty clear line on what dealers regard as actual prices ruling. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$15.00 to $15.25
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.00 to 16.25
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	11.00 to 11.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	25.00 to 25.25
Steel car axles	21.00 to 21.25
Locomotive axles	26.00 to 26.25
No. 1 busheling scrap	13.00 to 13.25
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	14.50 to 14.75
Sheet bar crop ends, shipping point	16.75 to 17.00
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

We note sales as follows: 1000 tons of turnings for June shipment and 1000 tons for July shipment, both at $10.50 in gross tons, delivered. Also 2000 tons of heavy steel scrap at $15 in gross tons, delivered Sharon, Pa., and 1000 tons for same delivery at $15.25 in gross tons. Dealers have bought in the past week or two about 2000 tons of borings on the basis of $8.75 in gross tons, Pittsburgh.

Chicago

FISHER BUILDING, June 29, 1910.—(*By Telegraph.*)

The iron and steel market in the West is entering the midsummer dull period without any notable features either of strength or weakness. Practically all the finishing departments of the steel mills have enough business on their books to carry them through the summer, and will continue in steady operation. The sheet and merchant mills of the Inland Steel Company will be shut down for only one week for repairs from July 2. The mills of the leading interest will all continue in operation. The Chicago mills are sold up for the year on rails, the bar mills are still behind on deliveries, and enough structural and plate business is coming to keep these departments going. Specifications for soft steel bars have been running twice as heavy in June as in May, and independent mills occasionally get premiums on orders for soft steel bars for prompt shipment. The hard steel bar mills will be down for a part of July, along with some of the bar iron mills. The dullest in the market is bar iron, which waits on railroad activity. The past six months has been a period of remarkable liquidation in the financial world and declining prices in the stock market, but the iron and steel industry in the West has had enough business to keep up production at nearly full capacity. The trade can drift along comfortably for a long time awaiting a buying movement by the railroads. This will be governed largely by crop conditions, especially the reports on spring wheat and corn. The spring wheat crop will mature within a few weeks in the Northwest, but corn will need favorable weather for 60 days to make a good crop. It will not require much buying from the railroads to place the market in the oversold condition which prevailed last fall. The scrap market is very quiet and dull, with lower prices for steel and heavy malleable scrap.

Pig Iron.—There is a little more activity in the Chicago

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iron market without any change in prices. A local sanitary interest has purchased 5000 tons of No. 2 Southern foundry and about 1000 tons of Northern. A plow manufacturer at Rock Island has purchased 2000 tons of No. 2 soft Southern. A thresher interest at Battle Creek, Mich., is reported to have closed for 4000 tons, about three-fourths Northern and one-fourth Southern, on deliveries extending into the first quarter. A local foundry in Chicago has purchased 2000 tons for last half divided between Northern and Southern, and there has been a fair run of scattering sales for third quarter and last half of both Northern and Southern grades. A plow manufacturer at South Bend, Ind., inquired recently for about 25,000 tons of foundry grades for deliveries extending through the last half or the first quarter, but the prices quoted evidently did not suit the purchaser, and it is understood that the inquiry has been suspended. A large tonnage of charcoal iron was included in the tentative estimate of the requirements. The leading Southern interests continue to hold for $12, Birmingham, for the last half, but buyers for third quarter have a considerable choice at $11.50, and some iron of No. 2 analysis can be had at this price for last half. Local furnaces continue to obtain $16.25 to $16.50 at furnace for current lots, switching charges, which average 50c. per ton, being added to obtain the delivered price which is quoted above. This price could be shaded on a round lot for third quarter delivery, but the furnaces are asking higher prices for last quarter and apparently are not anxious to book deferred business at this time, while the market remains out of reach of Ohio furnaces. Good inquiries for malleable Bessemer are expected as soon as the railroad malleable foundries are able to estimate the requirements of the railroad. Th following quotations are for July, August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.25 to 17.75
Northern coke foundry, No. 2	16.75 to 17.25
Northern coke foundry, No. 3	16.25 to 16.75
Northern Scotch, No. 1	17.75 to 18.25
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.60 to 16.10
Southern coke, No. 4	15.35 to 15.85
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	15.10 to 15.60
Southern mottled	14.85 to 15.35
Malleable Bessemer	16.75 to 17.25
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—There is practically no demand at this time of the year in Chicago territory, and the Pittsburgh market governs.

Rails and Track Supplies.—The standard rail business for 1910 is practically all on the books, and it will be some time before the railroads are in a mood to consider contracts for 1911. The demand for track supplies is easing off a little, and the competition of Eastern mills has made the market a little lower on spikes and track bolts. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.75; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—The University of Chicago is asking for bids on a building in the downtown district, at Market and Lake streets, which will require 3300 tons of steel. This building will be erected as an investment and will be leased to wholesale and manufacturing concerns. A new bank on Halsted street, in Chicago, which will require 485 tons, was let to the George A. Fuller Company. The American Bridge Company will furnish 670 tons of material and erect the machine shop of the Minnesota Steel Company at Duluth. The Des Moines Bridge & Iron Company has the contract for a naval warehouse at Mare Island, San Francisco, which will require 150 tons of material. The mills are getting better specifications than a month ago for structural material, and while concessions are made on desirable specifications, the general run of business is at 1.50c., Pittsburgh. We quote plain material from mill, 1.68c. to 1.73c., Chicago; from store, 1.90c. to 2c., Chicago.

Plates.—The market is quiet, but the mills have enough specifications to run them until the fall crop of car orders makes its appearance. We quote mill prices at 1.68c. to 1.73c., Chicago; store prices, 1.90c. to 2c., Chicago.

Sheets.—There is a fair run of new business, which is better than would be expected at this season, in view of the general talk of weakness in the market. The Inland Steel Company's mills will only be closed down one week for inventory and repairs, from July 2 to 11. All the finishing departments will be closed for the week, but the blast furnace will continue in operation. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—The bar mills continue to lead all other finishing departments in the steel industry. Specifications during June were about twice as heavy as in May, and there is a considerable run of new business. The agricultural implement people, profiting by their experience last year, are specifying early for their material. In hard steel bars there is a good run of business for concrete work as well as from industrial buyers. The bar iron market continues quiet, but there is a little better feeling growing out of the expectation that the railroads will have to buy liberally in the near future for car repair work. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.45c. to 1.50c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago.

Rods and Wire.—There are indications that prices will be $1 a ton lower during the last half of the year than the figures heretofore quoted in this market, as industrial business and orders of any size from the jobbing trade are being taken at 1.60c., Pittsburgh, for annealed wire and 1.80c. for nails and painted barbed wire, with the usual extras for galvanized stock and smaller sizes. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c., all Chicago.

Merchant Steel.—This is the quiet season of the year, but there is a fair run of small orders, and good specifications are also coming in from industrial buyers.

Cast Iron Pipe.—No important lettings are reported for last week excepting one of 1500 tons at Cincinnati, which went to the leading pipe interest. There is a good run of small lettings from Western municipalities, and routine inquiries are also keeping up. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—Scrap dealers see no immediate prospect of relief from the dullness in the market. While prices in most cases are holding steady, this is due chiefly to the fact that values are now very low in relation to the prices of finished material. There is an oversupply of steel scrap, especially in the grades like short melting rails, which usually command a premium. The rerolling mills are generally holding their crop ends for a more active market. Malleable scrap is hard to move and there are many reports of sales of railroad malleable in which dealers obtained less than $12, delivered. No. 1 cast holds steady and the rolling mills seem to take care of all the wrought scrap. Rerolling rails, however, are lower and buyers insist that even at the reduced prices they pay now this material is selling at too high a premium over other grades of steel scrap. Old car wheels are very slow and no sales to foundries have been reported for some time, leaving quotations nominal. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$17.00 to $17.50
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	15.50 to 16.00
Heavy melting steel scrap	12.75 to 13.25
Frogs, switches and guards, cut apart	12.75 to 13.25
Shoveling steel	12.25 to 12.75

The following quotations are per net ton:

Iron angles and splice bars	$15.00 to $15.50
Iron car axles	20.00 to 20.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Springs, knuckles and couplers	12.00 to 12.50
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	11.00 to 11.50
Steel axle turnings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.75 to 12.25
Agricultural malleable	11.50 to 12.00
Pipes and flues	9.50 to 10.00

Birmingham

BIRMINGHAM, ALA., June 27, 1910.

Pig Iron.—The leading producing interests adhere to a basis of $12, Birmingham, for prompt shipments or deliveries to cover the remainder of this year, but the current demand is being met by others at $11.50, except in cases where strictly last quarter shipment is stipulated. In such cases as those just referred to it is not believed that a

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better price than $12 could be had, although it cannot be stated definitely just what could be done on a round tonnage for delivery through the third quarter and into the last quarter. An aggregate of 10,000 tons is reported sold the past week. The sales include one or more lots of 1000 tons each, but in the main considerations were comparatively small and delivery to be effected within the next 60 to 90 days. The situation as a whole is more encouraging than at the time of last report. As has been the case for some weeks, all buyers are disposed to feel the market more or less, and inquiries are received in great volume, yet the requirements of certain large melters have taken form and evidence that prices have become attractive is offered in other directions. The actual movement from furnace yards continues to be satisfactory, when compared with the rate of production, and the comparatively few hold-ups of high priced iron are notable. It is now believed that reports of July 1 will show a very material reduction in the aggregate stock accumulations throughout the district, while the recent heavy sale of basic by a leading interest is expected to further reduce the active capacity for the production of foundry grades. At this time no preparations are being made for an addition to the number of active furnaces, and producing interests without exception manifest a disposition to pursue a conservative course both as to additions and as to sales at prices now ruling. The production of charcoal iron will be increased by another furnace just blown in, but without making an addition to the surplus over order book requirements.

Cast Iron Pipe.—The market is reported fairly active, with small lots the principal offerings. In view of the approaching inventory time and the usual suspension of operations producers generally are satisfied with conditions existing in the matter of orders actually on hand, but are concerned to some extent as to tonnage for fall and winter production. It is noted that no large contracts have been placed in some weeks, while the foundries have been in full operation for some months. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., average $21, with $1 per ton extra for gas pipe.

Old Material.—This market is very quiet, with prices at last revised being maintained. Dealers anticipate a material increase in the open market supply within the next fortnight by reason of the usual clean up by founders around July 1 for the taking of inventories, but there is as yet nothing in sight to indicate a larger consumption or greater demand at an early date. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

The furnace of the Shelby Iron Company at Shelby, Ala., has been put in blast after having been relined. This plant is now being operated on charcoal iron.

Philadelphia

PHILADELPHIA, PA., June 28, 1910.

While there is apparently more inquiry for both crude and finished materials, much of it has been to test the market. Lower prices have been uncovered on recent sales of fair sized lots of foundry iron, although some sellers still hold at figures practically above the market. Further interest is being shown in basic iron, with sales at lower figures for deliveries over the last half. The general situation, however, is not very strong, and, owing to the approaching holiday, rather quiet conditions are anticipated during the coming week. No particular activity is shown in finished materials. There is an absence of business of any size in plates and shapes and prices are not strong. The demand for steel billets is quiet, with prices unchanged. Sheets have been more active in view of the approaching midsummer shutdown of the mills. Old material is dull and prices in some grades show weakness.

Pig Iron.—Sharp competition for several desirable blocks of iron, which have been before the trade for several weeks, has resulted in lower prices. Sellers appear anxious to put orders on their books, and in some instances quotations made are reported as being considerably below actual cost. The local locomotive builder has closed for something over 4000 tons of 2.50 per cent. silicon and over, foundry iron, for shipment during the last four months of the year, at a price close to $16.25, delivered, and is now in the market for 1500 to 2000 tons of foundry forge for cylinder castings. The Pennsylvania Railroad has also placed orders against its recent inquiry at prices which have not been made public. Other good inquiries are being figured on, but in many instances these have been made largely to test the market. Except the large sales mentioned, transactions have been comparatively light, and the general run of smaller business is lighter. It is difficult to quote prices which satisfactorily represent the market under the varying individual conditions. The top of the market for No. 2 X eastern Pennsylvania foundry is close to $16.75, delivered, for last half shipment, sellers who have been holding above that figure having reduced their quotations. In many instances $16.50 can be freely done for the better grades of No. 2 X, and on sharp competition $16.25, delivered, has been done, although even lower prices are reported on less well known brands. In a few cases sellers refuse to meet the lower quotations, preferring to lose business than sell at figures which would mean a loss. Virginia foundry grades have not been active, one or more 1000-ton lots of No. 2 X have been sold in sharp competition at $13.75, Virginia furnace, which would represent $16.55 to $16.75, delivered, in this territory, during the third quarter, but very little iron has been sold in this vicinity. Small lots of No. 2 X have been disposed of at $14, furnace, but for any desirable tonnage the former quotation can be obtained. The differential between No. 2 X and No. 2 plain grades is not over 25c. a ton, and quite a number of producers quote the same price for both grades. Very little business in low grade iron has been done, some odd lots have been picked up by the cast iron pipe makers, but no sizeable business is reported. Forge iron has been in light demand, with prices nominal at $15.50 to $15.75 for the better grades for mill purposes. Pipe makers' views of prices for forge iron range full 25c. under these prices. Interest in basic iron has been somewhat more pronounced, one Eastern steel mill has taken between 15,000 and 20,000 tons for shipment beginning in July and extending over most of the last half, at prices ranging from $15.50 to $15.75, delivered. It is not probable that the inside figure could be done for further tonnage, as the circumstances surrounding the transaction at that price were unusual. The following range of prices for standard brands delivered in buyers' yards, eastern Pennsylvania and nearby points, shipment during the last half of the year, is named:

Eastern Pennsylvania, No. 2 X foundry	$16.25 to $16.75
Eastern Pennsylvania, No. 2 plain	16.00 to 16.50
Virginia, No. 2 X foundry	16.50 to 17.00
Virginia, No. 2 plain	16.25 to 16.75
Gray forge	15.50 to 15.75
Basic	15.75
Standard low phosphorus	22.75 to 23.00

Ferromanganese.—No business comes out in this territory, although there is still some demand from Western consumers, one inquiry now before the trade being for 2500 tons. Prices are practically unchanged, $39.50 to $40, Baltimore, about represents the market for 80 per cent. ferro, for last half shipment.

Billets.—There has been no improvement in the demand; consumers are placing business in small lots covering near future needs rather than contracting for probable extended requirements. Mills are not too well supplied with forward orders and the leading producers in this territory will take advantage of the dullness to make extensive alterations to furnaces, for which purposes the plants will be practically shut down on July 1. Standard basic open hearth rolling billets are nominally quoted at $28.50 to $29, delivered here. Forging billets are firm at $31 to $32, Eastern mill, dependent on specification and composition.

Plates.—New business is largely in small tonnages, although several moderate lots are before the trade. A fair volume of orders are coming to the mills, sufficient, in the aggregate, to enable about an average production being maintained. Prices show some variation; some makers are willing to accept desirable business at 1.60c., delivered in this territory; others, however, maintain firmly 1.65c., delivered, as a minimum for the ordinary run of orders.

Structural Material.—Mills in this territory report a very satisfactory tonnage for June. Few large contracts have been placed, business as a rule being of quite a miscellaneous character. Several good building specifications have been figured on, but they develop into orders rather slowly. Prices are unchanged; some makers will do 1.60c. for plain shapes, while others firmly maintain 1.65c., delivered here, as a minimum quotation.

Sheets.—A larger volume of business has been coming out, consumers wishing to get orders in before the usual midsummer suspension of mills for repairs. With increased business makers show less disposition to make price concessions, although on desirable specifications the following quotations, which represent prices for business of an ordinary character, can be slightly shaded: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

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Bars.—Very little business is being offered. Consumers are feeling the market to some extent, but inquiries are usually for small lots. Makers seem less inclined to make further price concessions, and quotations are unchanged at 1.47½c. to 1.55c. for refined iron bars and 1.60c. for steel bars, delivered in this vicinity.

Coke.—Considerable inquiry for foundry coke for second half delivery is pending, but consumers are in no haste to place orders. In many cases purchases are made for near future delivery only, as spot foundry coke is to be had as low as $2.10, at ovens, while for second half delivery $2.25 to $2.50 is named. Furnace coke has not been particularly active, quotations for last half delivery ranging from $1.65 to $1.85, at ovens. The following quotations, per net ton, are named for delivery in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—In some instances inquiry is a trifle better, but the market lacks strength. The associated mills now have all the heavy melting steel scrap they need at the time and offering prices for that grade are lower, ranging from $14.25 to $14.50, delivered. In the majority of instances buyers' ideas are below usual quotations, but sellers for the most part will not dispose of any heavy tonnages at the present price levels. What business there is has been confined to small lots for prompt shipment. Quotations, while to a large extent nominal, range about as follows for delivery in buyers' yards in this vicinity:

No. 1 steel scrap and crops	$14.25 to $14.50
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.50 to 20.00
Old steel axles	20.50 to 27.50
Old iron axles	26.50 to 27.50
Old iron rails	19.50 to 20.00
Old car wheels	14.50 to 15.50
No. 1 railroad wrought	16.50 to 17.00
Wrought iron pipe	15.00 to 15.50
No. 1 forge fire	12.50 to 13.00
No. 2 light iron	8.50 to 9.00
Wrought turnings	9.75 to 10.25
Cast borings	9.50 to 9.75
Machinery cast	15.00 to 15.50
Railroad malleable	14.50 to 15.00
Grate bars	12.50 to 13.00
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, June 29, 1910.—(*By Telegraph.*)

The month is closing very satisfactory in both crude and finished lines, and the last two weeks has seen some good coke contracts also. Warehouse business in bars, shapes and sheets has been excellent; certain large interests declare June the banner month of the year so far. July will see some changes in the furnace field; a number in both Northern and Southern districts are scheduled to blow out. This is expected to relieve the situation, which sees buyers skirmishing for a 50-cent lower price per ton in both districts, with furnace men presenting a remarkably independent front against shading the minimum figures for delivery over remainder of the year. Old material is if anything weaker and prices are nominal.

Pig Iron.—There is more interest in foundry iron this week, and buyers are apparently convinced that the bottom has about been reached. A large central Ohio interest, which felt the market last March for last half requirements and deferred buying, has another inquiry out for 2400 tons, half Northern and half Southern, analyzing about a No. 2 foundry in each instance, and announces that it will close on July 6. The inquiry of a north central Ohio iron works for 1000 tons of No. 2 and No. 4 foundry is still pending. Both are for last half deliveries. The last named inquiry is reported to be off because of the difference in views of buyers and sellers, the former holding out for $14.25 to $14.50, Ironton, on the Northern, and $11, Birmingham, or less, on the Southern. The inquiry of the south central Ohio iron works for 2000 to 3000 tons for last half is regarded as but a feeler. The Indiana maker of plows has deferred buying for 30 days. A northern Indiana manufacturer is asking for 1250 tons of Northern No. 2 foundry for last half and 250 tons of Southern for same period. The large central foundry interest in the market last week is reported to have bought 1000 tons for shipment to its Western plant, and a large tonnage, Valley, for Eastern shipment at a low figure. The Michigan stove concerns feeling the market last week are said to be still in the market, as are also four or five automobile manufacturers in the same vicinity. There is some interest in malleable. A 1500-ton contract was closed with an Indiana agricultural implement manufacturer on Monday and another of 500 to 1000 tons is in negotiation with a manufacturer in Terre Haute territory. Ohio furnaces are holding firmly to $15.50, Ironton, on malleable, but some are offering foundry for the remainder of the year at $15, and, while in certain cases an advantage may have been taken of a freight differential to certain advantageously located concerns, the prices named are believed to be the minimum. Two large Southern interests are holding firmly to $11.50 to and through the third quarter, with $12 the minimum for fourth quarter business. Forge and No. 4 foundry irons are still scarce, and while $10.50, Birmingham, can be done on a standard Alabama forge up to fourth quarter, $11 is the best offered for fourth quarter alone. A little increased interest is to be noted in Ohio silveries, and the quoted price is $18 for 8 per cent. Some Southern high silicons have been getting in on Michigan territory business at a shaded price for comparatively early delivery. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.50 to 14.75
Southern coke, No. 4 foundry	14.25 to 14.50
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern gray forge	13.75 to 14.25
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.70 to 17.20
Lake Superior coke, No. 2	16.20 to 16.70
Lake Superior coke, No. 3	15.70 to 16.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Some furnaces in the northern districts and in southern Ohio are either negotiating or have closed for their supplies from July 1. A Northern interest has closed for between 120,000 and 150,000 tons of Pocahontas furnace coke, deliveries to begin October 1, and running about 20,000 tons per month. A flat price was made on this contract and, while not announced, it is reported to be in the neighborhood of $1.85, ovens. Practically no change is noted in the Connellsville situation, and the price is as quoted last week. While Pocahontas furnace grades are obtainable for spot delivery as low as $1.75, certain brands are bringing as high as $1.90, and the contract price is $1.85 and up to $2. Wise County foundry grades are selling at $2.10 to $2.25, spot, and contract and furnace $1.85 to $2. New River coke is quotable at $2.40 to $3.25 for foundry, and furnace grades are held at $2.25 to $2.35. A number of good foundry contracts are being closed in this district.

Finished Iron and Steel.—Selling interests in this market report warehouse business the best for two months, and orders confined for the most part to small lots. Steel bars are quotable at 1.45c., Pittsburgh; small lots from store, 1.90c.; iron bars, 1.50c., Cincinnati, mill shipments, and 1.70c. out of stock, with little business reported. There has been a little run on structural plates, and while 1.50c., Pittsburgh, has been done unofficially for the past few weeks, that price is now officially recognized for the first time. Other structural shapes are quotable at 1.65c., Cincinnati, and out of stock, 1.90c. The boiler tube market is quiet. Sheets are in good demand, and about 10 weeks is the best that can be done on deliveries of No. 16 gauge and heavier, whereas two weeks ago deliveries could be promised in three to four weeks. One local seller announces the gross tonnage sold during June to exceed business of any other month this year. The Newport Rolling Mill Company, which will shut down for the annual repairs and improvements on July 1, has had an excellent year. It has been officially announced that the wage scale in the independent mills, of which the Newport concern is one, will remain the same as last year, and that there will be no strike. The Laughlin sheet plant of the Whitaker-Glessner Company at Martin's Ferry, Ohio, resumed operations June 20 after two weeks' idleness caused by a short supply of bars. The largest item in the structural field still in prospect is the highway bridge to span the Muskingum River at Zanesville, Ohio. Plans are in process of completion in the Cincinnati office of James A. Stewart, engineer, and bids will be invited in a few weeks. The estimated cost is $250,000.

Old Material.—Business in the scrap markets is at a standstill, but the big dealers are preparing for what they believe will be a significant revival of business in the fall. Hilb & Bauer, extensive dealers, owning yards and plant at 233 to 237 Mill street, are erecting additional buildings and have installed considerable new machinery, including three pairs of shears, one 4 x 4 in. and two smaller, and a heavy lifting magnet. The improvements will cost between $15,000 and $20,000. The Pennsylvania list is out to-day. The offerings are from shops and yards west of Pittsburgh. The Mobile & Ohio list is also out. Relayers were about the most active item during the week, one shipment of about 1500 tons going into the South, and at a price reported a trifle better than current minimum quotations, net. Cast borings are a little stronger and old car wheels are dragging

THE IRON AND METAL MARKETS

at $12 to $13 gross ton. As nearly as it can be gauged under existing conditions the market on material delivered in buyers' yards, Cincinnati and southern Ohio, is as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.00 to 5.00
Heavy melting steel scrap, gross ton	11.50 to 12.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	17.00 to 17.50
Old steel rails, short, gross ton	14.50 to 15.50
Old steel rails, long, gross ton	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.00 to 23.00
Old car wheels, gross ton	12.00 to 13.00
Low phosphorus scrap, gross ton	16.00 to 16.50

Cleveland

CLEVELAND, OHIO, June 28, 1910.

Iron Ore.—Shipments down the lakes continue heavy, and the June movement is expected to show an increase over May. Many consumers are still declining to take their ore and shippers are having considerable trouble in disposing of their cargoes because of the limited dock space. More boats are being offered than there are cargoes, in spite of the fact that many have been laid up as the result of the agreement of the independent vessel interests to take 20 per cent. of their capacity out of commission for 30 days. No sales are reported. We quote prices as follows, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market is dull in this territory, although one interest has received a fair volume of inquiry during the week from points west of Ohio. These include a few round lots of both foundry and malleable. Inquiries in this immediate territory have been limited to small lots of under 500 tons. Under the present condition of the market consumers who do not need iron for early shipment feel in no hurry to buy. Quite a few shipments have been held up during the past few days by plants that will shut down about July 1 for inventories. Some furnaces are still piling considerable iron, and the feeling is quite general that unless the demand improves materially soon more furnaces will go out of blast. Several producers are refusing to meet the competition of Valley furnaces that are quoting the low prices at present prevailing. Local furnaces appear to be underbid by Valley producers for shipment to points having the same freight rate from Cleveland as from the Valley. No. 2 foundry is quoted at $14.50, Valley furnace, for prompt shipment and the balance of the year. The market, however, is weak and that price might be shaded for a round tonnage. There is little inquiry for Southern iron, and the attempt to bring the price up to $12, Birmingham, has failed. We note the sale of one lot of 300 tons of No. 2 at $11.50, Birmingham, for the third quarter delivery. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$16.65
Northern foundry, No. 1	$15.75 to 16.00
Northern foundry, No. 2	15.25 to 15.40
Northern foundry, No. 3	14.75 to 14.90
Gray forge	14.90
Southern foundry, No. 2	15.85 to 16.35
Jackson Co. silvery, 8 per cent. silicon	19.50 to 20.00

Coke.—A fair volume of business is reported during the week in the way of contracts for foundry coke for the last half delivery, and a large share of the consumers in this territory are now covered with contracts. The furnace coke market remains quiet. We quote standard Connellsville furnace coke at $1.65 to $1.75 per net ton, at oven, for spot shipment, and $1.80 to $1.90 for delivery through the balance of the year. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 for spot shipment and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—While the demand is generally quiet mill agencies report some improvement as compared with the previous week, both in the volume of specifications and in new inquiries. Some of the specifications have come from consumers of bars who have contracts that expire July 1. These have generally specified for the full tonnage of their contracts, which are at current prices. Steel bars continue firm at 1.45c., Pittsburgh. The demand for iron bars is very light and prices are weak at 1.40c. to 1.45c., at mill. The demand for twisted steel bars for concrete work is quite active. The demand for structural material shows some improvement. Bids were received this week for the Niagara Falls plant of the National Carbon Company, 1000 tons, and the plant of the Lima Locomotive & Machine Company, 700 tons. The new plant of the Canton Sheet Steel Company will require 500 tons. There is a fair demand for small lots. We quote plain material at 1.50c., Pittsburgh, but this price is being shaded for round lots. The demand for plates is only moderate, and 1.45c., Pittsburgh, has become the ruling quotation for fair tonnages, although small lots are still bringing 1.50c. Tank shops in this territory are fairly busy and the demand from that source is holding up well. The demand for sheets continues light and prices are very irregular. Black sheets are being shaded fully $3 a ton and galvanized $4. Blue annealed sheets are firm. The demand for shafting is holding up well. Some of the mills are in a little better shape on deliveries. The first standard rail inquiry for some time is from the Wheeling & Lake Erie Railroad for 2300 tons of ferrotitanium rails and joints. The demand for light rails in car lots is quite active. Sharp competition is being felt from makers of rerolled rails. There is a fair demand for forging billets in car lots, sales being made at a minimum price of $31.50, Pittsburgh, or $33, delivered, Cleveland. Warehouse business with jobbers is holding up well.

Old Material.—The market continues extremely dull. Not only are the mills not buying, but because of the shutdown July 1 some of the consumers are refusing to accept shipments. Some are expected to buy scrap as soon as operations are resumed, but others have considerable stocks on hand. The market is weak. Some prices have declined and others are largely nominal. The Pennsylvania Lines West will close June 30 on a list containing about their usual tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.50 to 17.00
Steel car axles	21.00 to 21.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.50 to 14.00
Light bundled sheet scrap	9.75 to 10.25

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	9.50 to 10.00
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, June 27, 1910.

The somewhat sudden advent of extremely hot weather, while seasonably stimulating some lines of business, has tended to restrict foundry operations. General business, as shown by bank clearings, totals a gain over the corresponding week last year. A feature of the present time is the development of electric railroad lines in this State and in Illinois. Steam railroad development in the Southwest is on the increase. Crop prospects are good and the harvesting of grain is on in this section.

Coke.—Leading sales agencies report continued interest in coke, though there is no particular activity in the market as far as large contracts are concerned, and the large inquiry reported last week is still pending. There is, however, some business passing with smaller consumers, with encouraging prospects for closing some good-sized sales between now and July 1. An inquiry for 2500 to 3000 tons, shipment over a year, is reported. There is some irregularity in prices. Sellers usually ask $2.25 for prompt and $2.50 for contracts covering a year's delivery, but firm offers of the latter figure are being accepted (per net ton) for standard brands of Connellsville 72-hour foundry coke, f.o.b. oven.

Pig Iron.—When the number of sellers is considered the volume of business for the past week is comparatively small, one office reporting sales aggregating 2000 tons, another 1000 tons and a third 750 tons, all the rest having smaller totals. A large number of inquiries from both local and outside territory, however, indicates a lively interest and the leading brokers appear confident of a fair percentage rounding up in sales in the near future. Among the inquiries is one from a St. Louis company for 4000 tons of No. 2 Southern foundry, shipment depending on price. A feature of the inquiries is that, with the exception of one for 500 to 1000 tons of Northern malleable Bessemer, shipment over three months, all of them are for Southern iron, mainly for last half. Southern furnacemen, to some extent, are still pressing their agents for contracts, and in consequence offers of less than the recognized market price are being submitted. As a result the tone of the market is weaker. We name $11.50, Birmingham, for No. 2 Southern foundry for prompt shipment, and $12 for shipment over the last half, though it is likely some business has been worked in the Birmingham district at a concession from these figures. Southern Ohio is held at $15.50 to $16, f.o.b. furnace.

THE IRON AND METAL MARKETS

Old Material.—Though the demand from consumers, with the exception of a large sale to an east side steel foundry, is still ruling quiet, a more confident feeling prevails among the leading dealers and prices on some lines have been advanced. They state that some of the rolling mills are short of coal and have considerable scrap stock on hand, which for the present prevents taking anything in. There were no railroad offerings the past week. Relaying rails are in larger supply and the price has declined, though there is still a good inquiry. We quote dealer's prices as follows, per gross ton, f.o.b. St. Louis :

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	21.00 to 21.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.00 to 6.50
No. 1 busheling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	10.00 to 10.50
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.50 to 9.00

The Charter Oak Stove & Range Company, St. Louis, will build a new plant on a 16-acre plot near the east line of the city water works. Four buildings will be erected, comprising 270,000 sq. ft. of floor space, which, with three other buildings, call for an expenditure of $500,000. Edward Ward is the general contractor. The company has been established for 63 years. Among new incorporations are the following:

The Harrisonville Pump & Foundry Company, Harrisonville, Mo., capital stock, $5000; incorporators: N. P. Withington, H. H. Wright and J. H. Polhemus.

The Novelty Machine Company, Aurora, Ill.; capital stock, $25,000; incorporators: John Bermes, E. E. Beebe and William H. Stoudt.

The Weaver Mfg. Company, Springfield, Ill.; capital stock, $15,000; incorporators: I. A. Weaver and Edna F. Weaver; to manufacture and deal in tools and machinery.

The Boulevard Engine Company, St. Louis; capital stock, three-fourths paid, $10,000; incorporators: Howard B. Gentry, N. S. Brown, B. C. Winston and others; to manufacture and deal in gasoline engines.

Buffalo

BUFFALO, N. Y., June 28, 1910.

Pig Iron.—Inquiry during the week has been rather more limited in volume than for the preceding week and placements do not total over 10,000 tons, being principally for foundry grades. In several instances inquiries for individual tonnages of considerable amount originating two or three weeks ago are held open by buyers awaiting decision on expected contracts for finished material before closing for pig iron requirements on such contracts. Producers in this district report furnace conditions quite satisfactory, as shipments on contracts are heavy, fully covering present furnace capacity and permitting some reduction of furnace stocks as well. Prices are fully as firm as they were last week and the schedule given below represents the price situation as closely as possible:

No. 1 X foundry	$15.75 to $16.25
No. 2 X foundry	15.50 to 16.00
No. 2 plain	15.25 to 15.75
No. 3 foundry	15.00 to 15.50
Gray forge	15.00 to 15.50
Malleable	15.75 to 16.25
Basic	15.25 to 15.75
Charcoal	19.25 to 19.75

Finished Iron and Steel.—The demand for steel bars and most lines of finished products continues good, and orders are being received in fair volume. Prices for bars are firm at $1.45, Pittsburgh, for carloads and $1.50 for less than carload lots. Plates are held at straight $1.55 base, Pittsburgh, by the leading interest, although some of the other interests are quoting $1.50 for desirable orders. The demand for plain shapes is active. The local agency of the leading interest reports the closing during the week of a contract for a large tonnage, Central New York delivery. The inquiry for Canadian export delivery in structural shapes and plates is brisk, early delivery being required. The local demand for structural material continues fairly active. The Buffalo Structural Steel Company has received contract for fabricating and erecting steel for the Hardin H. Littell commercial building, 350 tons, and the Eastern Concrete Steel Company for the New York Central Railroad Company's warehouses at Ohio and Michigan streets. The D'Olier Engineering Company of Philadelphia was low bidder for the structural material and operating machinery (for cable system) for the gates for the United States ship canal now being constructed in Black Rock Harbor, this city, requiring 650 tons of steel, and the Penn Bridge Company, Beaver Falls, Pa., was low bidder for the gate material operated by the Spar system. The United States engineer at Buffalo has submitted the bids to Washington for decision.

Old Material.—Business in all lines of scrap material is extremely dull, the demand from the mills being practically shut off during the preinventory period. Trade is hardly of sufficient volume to establish prices, which are largely nominal, as follows, per gross ton, f.o.b. Buffalo.

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	18.00 to 18.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	14.50 to 15.00
Old steel axles	18.00 to 18.50
Old iron axles	22.50 to 23.00
Old car wheels	14.50 to 15.00
Railroad malleable	15.00 to 15.50
Boiler plate	11.75 to 12.25
Locomotive grate bars	11.50 to 12.00
Pipe	11.25 to 11.75
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.00 to 6.50
No. 1 busheling scrap	12.50 to 13.00

The German Iron Market

BERLIN, June 20, 1910.

The news from the iron trade during the past ten days leaves the situation still involved in much uncertainty. The market reviews remain rather contradictory, but their tenor is growing less confident. Some reports represent the situation as without change for a month or more; others admit that it has grown somewhat less satisfactory, but not one of them ventures to claim that it has improved. The conclusion to be drawn by the outside observer is evident—the trade is either at a standstill, or, more probably, on the down grade.

The report on the fortnightly trading in iron products on the Düsseldorf Exchange two days ago gives evidence of the uncertain state of the market. The quotation for bars was 109 to 115 marks, against 110 to 115 marks June 3. On the other hand, heavy plates were quoted at 120 marks, against 117.50 to 120, and thinner qualities at 130 marks, against 127.50 to 130; but it is very doubtful whether these latter quotations represent any real change in market prices, for the reports indicate a weakening of prices here and there, but nowhere a rising tendency.

The break in bars noted above reflects the insecure position in that section of the trade. The underbidding in prices by the Hoesch Works of Dortmund has continued. Several days ago this concern gave out a new price-list with further reductions, quoting 105 to 107 marks for the home market, according to point of delivery. For the foreign trade some of the reports mention as low a price as 100 marks f.o.b. Antwerp.

A piece of news that has attracted much attention in Germany was a reduction of 5.50 francs a ton in the price of semi-manufactured steel by the Belgian Steel Association about a week ago. This reduction was declared to be necessary in view of the action of the German Steel Syndicate and the Coal Syndicate in restoring their export bounties to the former level. This is a further step in the contest between Belgian and German producers in the English market, as previously described.

A meeting of the German bar convention, which was held on Friday, failed to clear up the uncertainties hanging over that section of the trade. The official report given out to the press says that progress was made in the direction of transforming this loosely constructed price convention into a firmly organized syndicate; but this statement has been received with pronounced skepticism in view of the fact that it is only a repetition of previous reports on the same matter, and nothing has yet come of the "progress" already reported.

A further indication of the unsatisfactory tendency of the trade is shown by the reduction in the steel shipments of the syndicate in May. These amounted to 387,600 tons, or only 10,000 tons more than in May, 1909, but 26,800 tons less than in April, 1910.

A report upon the situation in the Silesian district states that a feeling of decided pessimism prevails with some of the producers. Notwithstanding all the unfavorable elements in the general situation, however, the stock markets continue to show a pretty firm tendency for iron shares. The excellent grain crop prospects in nearly all countries are pointed to as a decidedly strong factor in the situation. Big yields of wheat and rye, it is argued, will give a fresh impulse to the iron trade.

THE IRON AND METAL MARKETS

New York

NEW YORK, June 29, 1910.

Pig Iron.—The June total of pig iron sales through a number of local offices will be close to the largest, if not in some cases the largest, for any month of the year. Yet there has been such a consecutive placing of this business, with no large volume of inquiry before the trade at one time, that the extent of the bookings has not been appreciated. However, the last week of the month shows less iron being inquired for than in any of the preceding weeks. Prices have been thoroughly unsatisfactory to sellers, and are lower to-day than at the beginning of the month. One inquiry of the past week is for 5000 tons, coming from a soil pipe and plumbers' supply foundry in New Jersey, 2000 tons being high silicon iron. Deliveries wanted reach to the middle of 1911. The water and gas pipe foundries have bought several lots of iron and malleable and stove foundries have been in the market, some inquiry of the latter class coming from Albany. In New England orders have been placed for 3000 or 4000 tons in moderate lots. Basic iron sales in eastern Pennsylvania have amounted to 10,000 tons or more in addition to those reported last week, and further inquiry for several thousand tons is pending. The prices named on foundry irons are the lowest of the year, from furnaces in eastern Pennsylvania, Virginia and western New York. It is evident that a number of furnaces are well sold for the third quarter, and some for the most of the fourth quarter; in other cases the disposition has been to pile iron and sell sparingly at the low levels. Consumers are generally provided for for the next two or three months, and some foundries are melting less iron as summer advances. We quote Northern foundry iron at tidewater as follows: No. 1, $16.75 to $17; No. 2 X, $16.50 to $16.75; No. 2 plain, $16 to $16.25. Southern iron is quoted at $16.50 to $16.75 for No. 1 and $16 to $16.25 for No. 2.

Steel Rails.—Sales of standard sections have not been large. The Tennessee Coal, Iron & Railroad Company has sold 550 tons to the New Orleans, Mobile & Chicago Railroad. The New York, New Haven & Hartford has bought 2000 tons from an Eastern mill. A Western road has taken 1500 tons of Bessemer rails at Chicago. An Eastern road has increased its season contract 2000 tons. Some foreign demand is noted. A Mexican road has bought 5000 tons and the Havana Central 5000 tons, while about 35,000 tons for Chile may be secured by American makers, and an inquiry from Mexico calls for 20,000 tons.

Cast Iron Pipe.—The volume of business is light, with little inquiry. No indications are visible of an early improvement in the demand. Carload lots of 6-in. are quoted at $25 to $25.50 per net ton, tidewater.

Ferroalloys.—There has been a good, steady buying of ferromanganese and a sale of 2500 tons is reported in Chicago at $39.50. It is being freely offered in New York at $39.50, delivered in Pittsburgh. The demand for ferrosilicon is good, but prices are low. Sales have been made at $58, Pittsburgh, and in some quarters this price is being shaded slightly.

Finished Iron and Steel.—With most in these lines June will close nearly if not quite equal to May and better than any corresponding month since 1907. Nevertheless it is an off season, and generally new business does not quite keep pace with the output, so that there is a gradual improvement in deliveries. Steel bars are the most delayed, being in some cases promised in not less than three months. Prices are somewhat weak, but only desirable tonnages of plates and shapes can so far be had as low as 1.45c., Pittsburgh. Very little structural material is inquired for in this vicinity. Two or three buildings requiring a fair amount are still in the market, but activity in this line is principally in other quarters. The Central Railroad of New Jersey has placed or will place a contract for 600 tons for a coal pocket, and the Pennsylvania has closed for the same amount for its new shops at Renovo. The Westinghouse, Church, Kerr Company has received bids on about 2000 tons for an extension to the Detroit Edison Company's plant. No award is reported on the Richmond Trust Company's building. The Erie Railroad is in the market for about 1500 tons for a lift bridge on its Mahoning division. The plate trade is interested in four submarines to be built for the Navy, three in New York and one in Bridgeport. Another Eastern shipbuilder is in the market for 2000 tons of ship plates. Bids have been asked on the remodeling of the dredge Thomas as a tank ship. From 150 to 300 tons of plates will be needed for the conversion. No award has yet been made either for the work or the material. Opinions differ on the bar iron situation; while it is generally reported rather quiet, one mill declares that it is doing a good business, and that June will be its best month this year. We continue to quote plain structural material and plates at 1.61c. to 1.66c.; steel bars at 1.61c., and bar iron at 1.50c. to 1.55c., all New York.

Old Material.—The mills are busy and are consuming good quantities of scrap, but their buying is for immediate needs only, as they are looking for further reduction in prices as a result of the agreement between several Eastern mills to purchase their scrap through one agent. The steel rail business is very active. The railroad requisitions for the most part have been placed. Car axles are very scarce and also wrought pipe. The latter is the only thing that the rolling mills are seeking keenly. Melting steel scrap is in fair demand, but malleable cast is a little weaker. A little improvement in the scrap market generally is evident as compared with the last two weeks. Quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$13.00 to $13.50
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	6.00 to 6.50
Cast borings	6.50 to 7.00
Wrought turnings	7.00 to 7.50
Wrought pipe	12.00 to 12.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, June 29, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
June.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
23	12.75	12.50	12.62½	4.37½	4.22½	5.15	5.00
24	12.75	12.50	12.62½	4.37½	4.22½	5.20	5.05
25	12.75	12.37½	....	4.37½	4.22½	5.20	5.05
27	12.75	12.37½	32.65	4.37½	4.22½	5.20	5.05
28	12.75	12.37½	32.85	4.37½	4.22½	5.20	5.05
29	12.75	12.37½	33.00	4.37½	4.22½	5.20	5.05

The buying movement in copper seems to have ended for the time being and prices have weakened perceptibly. Pig tin has been selling better and the outlook is promising. Lead holds firm, but there is not much demand, and the spelter market is stagnant.

Copper.—The copper market is quiet and the price of electrolytic copper has weakened noticeably. It is estimated that in the recent buying movement about 30,000,000 lb. of copper was sold, and of this amount fully 15,000,000 lb. will go into domestic consumption. Much of this copper was bought for delivery within the ensuing three months, which is taken as an indication that many consumers had let their stocks run quite low. Notwithstanding the heavy buying, however, the market is not very strong, and this is largely due to the fact that the London market is noticeably weak and the trading there is light. While the demand for lake copper is not particularly good prices on the better known lake brands are being kept up. The American Metal Company and the United Metals Selling Company both seem to be out of the market, as they are quoting prices in response to inquiries that are far above the average quotations. As the statistics of the copper producers are expected to be issued within 10 days at the most the trade does not expect to see much business before the figures are out, as it is thought that most consumers will await the producers' statement before doing any more buying. Some large sellers of copper are asking 12.50c. for electrolytic, but it is freely offered at 12.37½c., and that is considered the market price. Lake copper is firm at 12.75c. Exports of copper so far this month have been 19,662 tons and the imports have been about 19,000 tons. In London to-day the market was firm, and spot copper sold for £54 18s. 9d. and futures went at £55 10s. 6d. The sales amounted to 1000 tons of spot and 800 tons of futures.

Pig Tin.—The pig tin market has been fairly active during the week, and indications are that the statistics for June will be favorable, so better prices are being looked for. There was a good buying movement in tin last Friday, and yesterday and to-day a fair business was done. It can be seen by the daily prices given above that the metal has been steadily advancing. It is fairly certain that the monthly statistics will show a decrease in the visible supply. They will certainly show heavy American deliveries into consumption, and a close concentration of stocks. The figures will also show only a very little supply of available stocks. The arrivals of tin so far this month have been 3705 tons, and on June 1 American stocks were estimated to be 2000

Mechanical and Civil Engineers, PITTSBURGH, PA.

THE IRON AND METAL MARKETS

tons. This would make the available stocks during the month about 5700 tons, while conservative estimates have it that fully 4000 tons of metal have been sold during June, which would make the available supply of tin about 1700 tons. There are 2530 tons of tin afloat, but very little, if any of it, will arrive in this country before the month is out. Summed up the indications are that the pig tin market will go higher. The London market closed to-day with spot tin selling at £148 15s. and futures at £149 15s. The market was quiet and the sales amounted to 80 tons of spot and 100 tons of futures. This afternoon there was a flurry in the tin market because of the positive announcement that the June deliveries of tin would amount to fully 5000 tons. This exceeds all records of one month's delivery, and all sorts of prices were being quoted. The market was conservatively placed at about 33c.

Tin Plates.—The advanced price of foreign tin plates made last week to 13s. 4½d. at Swansea, Wales, is being well maintained, and there is a good demand for foreign tin plates both here and abroad. The market for domestic tin plates continues good, but stocks are becoming more plentiful. The price for 100-lb. coke plates is $3.84.

Lead.—The lead market continues firm, but not much metal is being bought. It is generally thought that consumers' stocks are low, and it is highly probable that a buying movement of any size would bring the prices quoted by outside sellers up to the quotations of the American Smelting & Refining Company, which is being firmly held at 4.40c., New York. At present outside traders are offering the metal at 4.37½c., New York, and 4.22½c., St. Louis.

Spelter.—A peculiar condition exists in the spelter market. There are practically no stocks of spelter in New York and some people are bidding as high as 5.50c. for spot spelter. They are perfectly safe in doing this, however, as there is none for sale, and the sellers are quoting the metal, f.o.b. St. Louis, at 5.05c. This makes the price 5.20c. delivered in New York, and that is the nominal quotation. As far as buying is concerned the market is stagnant. It would not be safe to predict what will happen to spelter prices when a demand for the metal develops.

Antimony.—There has been a little purchasing in the cheaper grades of antimony, but the demand for the better known grades is very light and prices are weak. Cookson's is 8.37½c. and Hallett's 8.12½c. It is said in the trade that these prices are being cut.

Old Metals.—The market is weak. Dealers' selling prices are as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.50 to 8.75
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	7.50 to 8.00
Composition turnings	9.25 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.25 to 4.50

Metals, Chicago, June 28.—A fair amount of business is being done with consumers of copper, few of whom, however, are willing to buy farther ahead than a month's supply. On the whole, the sales to consumers in this territory during the first half of the year have averaged about a normal volume of business. The railroads have economized, which has affected buying of metals by equipment manufacturers, but the growth in the automobile industry has evened up the lines in which the demand has been less. Spelter is dull and tin fluctuates within a narrow range. The spelter market will undoubtedly feel the falling off of work in the sheet mills, as well as the lighter demand for wire in the summer months. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33½c.; small lots, 35c.; lead, desilverized, 4.30c. to 4.35c., for 50-ton lots; corroding, 4.50c. to 4.60c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.20c. to 5.25c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12¼c.; red brass, 11¾c.; yellow brass, 9¼c.; light brass, 6½c.; led pipe, 4¼c.; zinc, 4¼c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, June 27.—Lead is firm at 4.25c. to 4.30c. Spelter is quiet at 5c., East St. Louis. Zinc ore is strong at $38 to $40 per ton, Joplin base. Tin is 5c. per 100 lb. lower; antimony is up 17½c. per 100 lb. on best grade; copper is ⅛c. higher. The demand for finished metals, though fair, is not regarded as good as it ought to be.

Iron and Industrial Stocks

NEW YORK, June 29, 1910.

Stocks have been under heavy pressure, with liquidation apparent by both large and small holders, although there has been no specially unfavorable development financially. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows, with no transactions recorded in quite a number of such stocks:

Allis-Chalm., com..	8¼- 9	Pressed St., com..	36 - 36¾
Allis-Chalm., pref..	30½- 32	Pressed St., pref.	96½
Beth. Steel, com.	26	Railway Spr., com.	33 - 34⅞
Can, com.	8⅞- 9¼	Republic, com.	30¾- 34⅞
Can, pref.	69¾- 72	Republic, pref.	93¾- 97
Car & Fdry, com..	52 - 57	Sloss, com.	66 - 70⅞
Car & Fdry, pref..	113 -114	Pipe, com.	15¼- 18¾
Steel Foundries...	51¾- 56¾	Pipe, pref.	49 - 60
Colorado Fuel.	32⅝- 36¾	U. S. Steel, com...	73⅝- 79¾
General Electric..	143 -148	U. S. Steel, pref..	114½-116¾
Gr. N. ore cert.	56 - 62	Westinghouse Elec.	61½- 67½
Int. Harv., com.	96 -100	Am. Ship, com.	80¼
Int. Pump, com.	42¾- 46⅞	Chi. Pneu. Tool...	39 - 39⅞
Int. Pump, pref...	82½- 84½	Cambria Steel....	44⅝- 45¼
Locomotive, com...	40¼- 44¾	Lake Sup. Corp...	21⅝- 22
Locomotive, pref..	107½-108	Crucible St., com..	11½- 13⅛
Nat. En. & St.,com.	18½- 19	Crucible St., pref..	79 - 82
Nat. En. & St.,pref.	95		

The Canadian Government has indicated to Secretary of State Knox its desire to take up as early as possible the negotiation of a trade treaty with the United States. This action is in reply to a letter from Mr. Knox to the Dominion Government, suggesting such a course. This letter was sent on May 12. In its response the Canadian Government expressed its earnest desire to take up formal negotiations at as early a date as possible, but regretted that it would not be possible to do so until autumn.

The Midland Railway Motor Car Company, Philadelphia, has contracted for the output of gasoline street railroad cars made by the Buckeye Mfg. Company, Anderson, Ind., which has for several years manufactured the Lambert friction drive automobile and has begun building street railroad cars operated on the same principle. The standard gauge cars have recently received thorough tests on the Central Indiana Railroad and Indiana interurban lines.

The Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, works at Rochester, Pa., is operating to full capacity. The company's products are showing excellent results on steel and malleable iron castings, machine tools, &c., and it is from these sources that many repeat orders are being received. Contracts on hand insure steady operations for several months ahead.

The J-M Roofing Salesman.—The Cleveland branch of the H. W. Johns-Manville Company, 813 Superior avenue, N. W., Cleveland, Ohio, has brought out a small four-page paper called the *J-M Roofing Salesman*, which will be issued the 28th of each month, to call attention to the J-M roofings and allied building materials. This is a companion publication to the *J-M Packing Expert*, which was issued for the first time four months ago, and is devoted to the asbestos high-pressure steam packing made by this company.

Stack No. 2 of the Dunbar Furnace Company, Dunbar, Pa., has been in operation continuously for four years, and during that time has turned out about 290,000 tons of iron. The company's No. 1 stack has been undergoing repairs which have been about completed, so that the furnace can be put in operation when it is required. A heavy duty blowing engine built by the Mesta Machine Company, Pittsburgh, has been installed and is in operation in connection with the No. 2 stack. New air lines have been constructed for both furnaces.

Iron Ore in Northern Ontario

Considerable interest is taken in the reports brought to Toronto, Canada, about the iron ore deposits at Grand Rapids, on the Mattagami River. The Mattagami is a tributary of the Moose River, the trunk stream draining the northern part of Algoma district into James Bay. From Moose Factory, which stands at the point of the Moose River's discharge into James Bay, the ore deposits are about 60 miles south. They are about 100 miles north of the National Transcontinental Railway and from the Temiskaming & Northern Ontario Railway, the former belonging to the Dominion Government, to be operated by the Grand Trunk Pacific Railway Company, and the latter belonging to the Ontario Government. It is expected that the Temiskaming & Northern Ontario will eventually be extended to James Bay, recent mineral discoveries appearing to warrant the carrying of the line to such a northern terminus.

The iron ore deposits at Grand Rapids were not previously unknown. They were discovered in 1875 by Dr. Robert Bell of the Canadian Geological Survey, and were again brought to notice in 1903 as a consequence of explorations made by a party sent out by the Ontario Bureau of Mines. The Bureau's report for 1904 contains a description of the deposits, whose contents are classed as of the limonite variety of ore. The ore body is very large, and the metallic iron found in some cases is as much as 60 per cent., phosphorus being present to the extent of about 0.08 per cent. Parties who have been up in the field staking claims this spring bring back very optimistic accounts of the quantity of ore in sight and the quality of it, and they incline to the opinion that the ore is brown hematite. They say that no other known ore body in Canada is to be compared with this one in economic importance. If the ore is as good and plentiful as official and private reports agree in representing it to be, the railway is almost certain to be pushed on to the place at which it is located.

The union structural iron workers on strike at Buffalo for an advance in wages from 50 to 60 cents per hour have refused the offer of employers to compromise at 55 cents per hour, effective September 1, demanding 56¼ cents per hour until September 1 and 60 cents per hour after that date. The contractors declining to meet this demand resumed work on buildings under construction Monday morning with non-union men.

The Alan Wood Iron & Steel Company, Conshohocken, Pa., will shut down its Ivy Rock steel plant on July 2 for repairs and alterations to its open hearth furnaces, to accommodate them for the use of hot metal, to be supplied later from its Swede furnaces. Its Conshohocken sheet mills will be shut down at the same time for the customary midyear repairs.

At a meeting of the stockholders of the Phoenix Iron Company, held at its office in Philadelphia June 28, a bond issue of $1,500,000 was authorized. These bonds will run 20 years and the proceeds will be used in retiring a bond issue of $930,000 which falls due on September 1. The balance will be used in extending the business of the company.

At the recent election of officers of the Crocker-Wheeler Company, Ampere, N. J., the following were chosen for the ensuing year: President, Schuyler Skaats Wheeler; first vice-president, Gano Dunn; third vice-president, Arthur L. Doremus; chief engineer, Gano Dunn; secretary, Rodman Gilder; treasurer, W. L. Brownell.

New Canadian Docks, Shipyards and Warships

Wm. Pugsley, Minister of Public Works, in the Dominion Government, says that he has been officially informed that the British company, with which Sir Robert Perks is connected, is preparing plans for a dry dock and shipbuilding plant at St. John, N. B., and that the plans will soon be submitted to the Government. Sir Robert Perks has for some time been negotiating with the Dominion Government to obtain the contract for building the Ottawa River and Georgian Bay Canal.

Albert Vickers, of the British shipbuilding firm, Vickers, Son & Maxim, recently conferred with Mr. Pugsley and Mr. Brodeur, Minister of Marine and Fisheries, on the subject of the dry dock his company proposes to build at Montreal. Besides a floating dry dock and ship repair plant, the company, it is said, proposes to go into shipbuilding and to manufacture car wheels.

It is practically decided by the Canadian Government to have the warships provided for last session of Parliament built in Canadian yards if the work can be done there so as to cost the Government not more than 25 per cent. above what the vessels could be turned out for by British firms. Owing to the fact that the plans of the British warships on which the vessels of the Canadian navy are to be modeled must be kept secret, tenders for the building of the Canadian ships will not be called for in the ordinary way. The designs will be submitted to only such Canadian and British firms as wish to compete.

The insurance companies which make a specialty of investments in farm mortgages have raised their interest rates in central Kansas to 7 per cent., the highest since 1895. Loans have been restricted to gilt edged securities, and several of the companies have withdrawn from the field.

The Electric Steel Company, 50 Church street, New York, recently made the first heat at its new plant at New Milford, Conn. The company manufactures Electric high speed hammered tool steel, for which it has a capacity of 5 to 6 tons a day from two 14-pot crucible furnaces.

The Western Steel Corporation, Irondale, Wash., rolled its first steel June 24. The company has two open hearth steel furnaces in operation, and the steel produced was rolled for the purpose of testing its 22 and 14 in. rolling mills.

The second blast furnace of the Detroit Iron & Steel Company, Detroit, Mich., has been completed. This stack will be blown in within the next week on foundry and malleable iron. It has a daily capacity of 300 tons.

The Asbestos Protected Metal Company, Canton, Mass., has recently opened an office at 100 Broadway, New York. P. M. Stewart, formerly building commissioner of New York, is resident manager.

The Empire Steel & Iron Company, Catasauqua, Pa., has banked its Crane furnaces at that point, owing to labor difficulties, which originated, it is understood, with its locomotive engine men.

The blooming mill of the Phoenix Iron Company, Phoenixville, Pa., was slightly damaged by fire on June 20, but not sufficiently to inconvenience the operation of the mill.

Obituary

JOHN P. LEVAN, president of the Altoona Iron Company, Altoona, Pa., died in that city June 3, aged 76 years.

JOHN G. POPE died at Alameda, Cal., May 30, from the effects of an accidental fall. He was born at New Bedford, Mass., in 1865. He received his higher training at Iowa State College and later was employed in the Allis shops at Milwaukee and one of the plants of the General Electric Company. In the early eighteen-nineties he was connected with the Webster, Camp & Lane Machine Company, Akron, Ohio. On the reorganization of the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, in 1899, he was made general manager and later was president of the company. He removed to the Pacific Coast in 1905 and represented a number of Eastern manufacturers of machinery in San Francisco. He leaves a widow and four children.

FREDERICK W. SIVYER, president of the Northwestern Malleable Iron Company, Milwaukee, Wis., whose death on June 11 has been noted in these columns, was a prominent figure in the malleable castings industry. He was a self-made man, acquiring his education, for the most part, after he had become a wage earner. His connection with the foundry business dates from 1873, when he entered the shops of the Minerva Furnace Company in Milwaukee. In 1875 the malleable castings firm of Harris & Sivyer was formed and later Mr. Sivyer was connected with the Wisconsin Malleable Iron Works. The Northwestern Malleable Iron Company was incorporated in 1888, but the business was started by Mr. Sivyer in 1882. He was one of the leading manufacturers of Milwaukee and was prominent in industrial and trade movements both locally and nationally. He had an important part in the introduction of industrial education in Milwaukee, being chiefly instrumental in the founding of the Milwaukee School of Trades. His son, Frederick L. Sivyer, is vice-president of the Northwestern Malleable Iron Company. He leaves a widow.

JOHN M. ROGERS, head of the John M. Rogers Works, Inc., Gloucester City, N. J., died June 4, aged 68 years.

GUY R. JOHNSON, for several years vice-president and general manager of the Alabama Consolidated Coal & Iron Company, Birmingham, Ala., and recently elected president of the Fayette Coal & Gas Company of that city, died June 23 from a self-inflicted wound. He was 43 years old. Mr. Johnson was one of the best known blast furnace managers of the country. His earlier experience was with the Embreeville Iron Company, Embreeville, Tenn., of which he was manager in the eighteen-nineties. Then in turn he was blast furnace superintendent of the National Steel Company, Youngstown, Ohio; Carnegie Steel Company, Duquesne, Pa., and Illinois Steel Company, South Chicago. He became connected with the Alabama Consolidated Coal & Iron Company about four years ago. He leaves a widow and three sons.

PAUL SCHNEIDER, who for years has been prominently identified with the gas stove industry in this country, died June 23 at his home in Bedford, Ohio, a suburb of Cleveland, at the age of 66 years. He had been in poor health for two years. He was born in Germany and located in Cleveland in 1873. With Henry Trenkamp he formed a partnership in 1879, and commenced the manufacture of a gasoline stove. Later the manufacture of gas stoves was taken up. From a small beginning the business grew into a large plant, under the name of the Schneider & Trenkamp Company. Mr. Schneider was one of the organizers in 1902 of the American Stove Company, and the Cleveland plant has since been known as the Schneider & Trenkamp division of that company.

The Last of the Lake Whalebacks.—As is well known, the whalebacks, of which so much was expected in the lake ore carrying trade, proved unsatisfactory and have practically gone out of use. For one thing, their peculiar shape made impossible the use of modern unloading machinery. This season but four of the seven boats belonging to the Great Lakes Engineering Works, Detroit, have been operated in the coal and ore trade on the lakes and three have been lying idle at the Ecorse shipyard, Detroit. These last of the whalebacks were taken in part payment for new vessels built for the United States Steel Corporation. It is stated that the Great Lakes Engineering Works will probably dispose of all of them. Within the past few years a number of boats of the original whaleback fleet have been taken to the Atlantic Coast and used in the coal trade or converted into oil barges, and this may be the ultimate disposition of the remaining seven still on the lakes.

W. N. Kratzer & Co., Pittsburgh, manufacturers of structural steel and iron work, are furnishing fabricated structural steel for the Baltimore Union Station, Baltimore, Md., about 1200 tons; for a factory building for the Jackson Cushion Spring Company, Jackson, Mich.; for a factory building for the Central Foundry Company, Jackson, Mich.; a power building for dams Nos. 8 and 11, Ohio River Improvement, and material for the Eagles Club Building, Cleveland, Ohio. The company is also furnishing fabricated structural steel and erecting it in the burner building, power building, conveyor trestling and gas producer building for a large chemical plant at New Castle, Pa., and for St. Josephat's Church, South Side, Pittsburgh, and for a large tank and storage building for the Canfield Oil Company, Coraopolis, Pa.

The International Harvester Company of Canada, Ltd., has completed several extensions to its plant at Hamilton, Ont., and now has under construction a building, 140 x 150 ft., two stories and basement, which is an addition to its gray iron foundry; a new manufacturing building, 72 x 305 ft., four stories and basement; an extension to paint shop, 72 x 95 ft., four stories and basement. The company also expects to begin soon the erection of a warehouse, 120 x 200 ft., four stories and basement. All of these buildings are expected to be ready for occupancy by November 15. The increased capacity and facilities are required to meet the development and expansion of its Canadian business.

The Youngstown Car Mfg. Company, for some years manufacturer of industrial and freight cars, with works at Youngstown, Ohio, has decided to abandon the building of cars. In the future the concern will devote its attention to the manufacture of reinforced roofing tile, under the name of the Reinforced Tile Roof Company, Youngstown, Ohio, the concern having been operating that branch of its business for over a year, and it will also continue to make the Wagenhorst electric blue printing machines under the name of J. H. Wagenhorst & Co., Youngstown, Ohio. The company has been operating that branch of its business for five years.

George T. Ladd, power equipment engineer, Farmers' Bank Building, Pittsburgh, has sold to the Republic Iron & Steel Company for installation in its Sylvan Works, Moline, Ill., a 32 x 48 in. Bass Corliss horizontal engine with complete rope drive; to the American Can Company, Baltimore, Md., and the Superior Steel Company, Pittsburgh, heavy duty rope drive. He has also made a number of sales of Houston steam specialties consisting of high and low water alarms, blow-off valves, steam traps and separators.

The Machinery Markets

Reports from machinery centers indicate that business is brisk in some quarters, while in other parts of the country the expected summer dullness prevails. Building activities in and about New York are bringing some business, and there are indications that there will be some good orders from the automobile trade within a few weeks. The railroads are disappointingly slow in making purchases against lists now before the trade. In Philadelphia there has been a better volume of business in machine tools, and in Boston and other New England centers it is apparent that the June business will equal the average of April and May. The machinists' strike in Boston and vicinity has not as yet affected machine tool builders, and owners of works that are affected are making good gains in replacing dissatisfied labor. In Chicago the Burlington & Quincy Railroad has issued a large list of machine tools, and the American Bridge Company has purchased extensively through its Pittsburgh offices for its Gary, Ind., plant. In Milwaukee business is rather quiet, but there is a healthy demand for small electric power units and motors. In the Northwest there is a good scattered business, and a demand for power and heating plants has developed. In the Southwest the machinery buying is only for current needs, but there are strong indications of a better future business. In the Central West trade is holding up well, and in Detroit business is so good that a stiffening in price is noticed. The buying on the North Pacific Coast is largely for single tools. The diversity of the manufacturing and jobbing interests in the South is supporting all branches of the machinery market in that territory, and there is a good volume of orders for single tools for replacement. In Pittsburgh inquiries now before the trade indicate that some machine tool lists will appear shortly in that market, and there is an immediate demand for equipment coming from small coal mining companies. The second-hand machinery market in Pittsburgh is being well supported.

New York

NEW YORK, June 29, 1910.

The immediate demand for machine tools in the Manhattan territory is only fair, but there are some good prospects in sight and renewed buying is looked for within a week or two. The New York Central Railroad is placing some orders against a large list issued several weeks ago, but the major portion of the business has not been closed as yet. The Delaware, Lackawanna & Western Railroad continues to defer purchasing against the list issued for its Scranton shops, but machinery men who are in touch with the situation have been assured that the buying will be done within a few weeks. Some good business is promised from the automobile business in this territory, and some machinery houses in New York have inquiries which indicate that orders will come from that source in a short time. Long Island City is getting to be quite an automobile center. The Palmer-Singer Company, which recently bought large quantities of machinery equipment for a plant there, is said to be in a position to utilize all the equipment it has in hand and may have to enlarge.

Brewster & Co., manufacturers of automobile bodies, Broadway and Forty-second street, New York, are equipping a plant in Long Island City which it is understood will be used for the manufacture of automobile bodies, and the Packard Motor Car Company has plans for a factory there. It is not known in the trade whether the latter company's plant will be a repair plant or whether it will be used for the manufacture of auto trucks. The recent growth of the automobile business in the East has been marked, and the desire on the part of the automobile manufacturers to locate plants in this territory is largely influenced because of the fact that labor is hard to get and hard to handle in present automobile manufacturing centers.

American firms have been asked to bid on contracts for constructing an extensive system of electric trolley lines in Constantinople, Turkey. The Consul General of Turkey, 59 Pearl street, New York, has specifications which were forwarded by the Minister of Public Works in Constantinople. Franchises on five lines are offered to successful bidders on the work and on such other lines as the bidders may propose which the Government finds desirable are to be included in the concessions. It is understood that a number of American companies are preparing to offer bids, and if the work is secured by a firm in this country it is probable that considerable in the way of railway and machine shop equipment will be purchased.

The United Lead Company, 100 Broadway, New York, is endeavoring to concentrate its various enterprises, and with that object in view has made plans for the erection of a mill for making lead pipe and sheet lead and a plant for the manufacture of loaded shells for shotguns. The rolling mill will be 40 x 300 ft. and the other plant is being built for the United States Cartridge Company, Lowell, Mass., in which the United Lead Company has a controlling interest. Plans for the latter factory have not been completed yet, but it will consist of two reinforced concrete buildings of a size not yet determined. It is understood that the plant will cost about $100,000 and work on it will be begun in the near future.

The Roessler & Hasslacher Chemical Company, 100 William street, New York, is arranging for the construction of a large plant at Perth Amboy which will consist of six buildings and a shipping wharf to cost approximately $400,000. The buildings are to be of modern fireproof construction and contracts for some of the work have been let. The Goeller Iron Works, Newark, N. J., will furnish the structural iron, and a general erecting contract has been given to the George W. Mercer Construction Company.

The Spicer Mfg. Company, Plainfield, N. J., is moving a part of its plant from its present central location in Plainfield to South Plainfield, where it has purchased a tract of land adjacent to the Lehigh Valley Railroad tracks. At present the drop forging department will be located on the new site and it is probable that later the rest of the plant will be shifted. The company has been purchasing new drop forging equipment for the purpose of increasing its output.

The Hunso Machinery Company, 351 Ellicott square, Buffalo, N. Y., has been organized to manufacture special machinery for mixing fertilizer. The company has arranged to have its product made for a time, but later on will erect a plant of its own. The officers are R. D. Soars, president; E. A. L. Soars, vice-president, and W. D. Huntingdon, secretary and treasurer.

The Federal Railway Equipment Company, which is closely connected with the Sterling-Meeker Company, Newark, N. J., will shortly move its plant to Rochester, N. Y., where it will be located in an existing building at Platt and Otsego streets, that city. The company will manufacture cash fare registers for street cars, railway brakes and other railway equipment.

The Celluloid Company, Newark, N. J., is building an addition to its plant at 31-35 Westcott street, Newark. This company recently made extensive additions to its plant and was a generous purchaser in the New York machinery market. The new building will be a brick addition, costing about $7500.

The Porter-Cable Machine Company, Syracuse, N. Y., has leased the Thomas Hooker Building, Grace and Water streets, and after July 1 will occupy the entire three floors for the manufacture of high speed milling attachments and machine shop accessories. The company now employs 25 men and expects to treble its working force. Raymond E. Poter is president; George F. Porter, vice-president, and F. E. Cable, secretary-treasurer.

The Quartermaster of the United States Army, West Point, N. Y., will receive proposals until July 6 for furnishing and installing extensions to the steam distributing system. Forms for proposals will be furnished upon application to him direct.

The American Railway Supply Company, 24 Park place, New York, has just filled an order from a large manufacturing company for 128,000 pay and tool checks. This is said to be the largest single order for tool checks ever given.

THE MACHINERY MARKETS

The Greenville Motor Products Company, Inc., has secured the building formerly occupied by the Shelby Steel Tube Company, Greenville, Pa., and will move its plant from Jamestown, N. Y. The company manufactures automobile specialties and will require some machine tools and standard shop equipment.

The United States Rubber Reclaiming Works, Buffalo, N. Y., is building an extensive addition to its plant at Babcock and Hannah streets and the Erie Railroad, consisting of a mill building 60 x 274 ft., two and three stories, of brick and concrete construction, and an office building. A large amount of rubber grinding and sheeting machinery will be installed, practically doubling the capacity of the plant. Most of the required equipment has already been arranged for. The plant is operated by Niagara Falls power, and when the new addition is completed between 2500 and 3000 hp. will be used. The motor equipment is to be increased by the addition of one 1000-hp. motor, one 200-hp. and several smaller motors. Frank H. Brewster is general superintendent, 724 Babcock street.

The Rudolph Wurlitzer Mfg. Company, manufacturer of musical instruments, will build an extensive addition to its plant at North Tonawanda, N. Y., having acquired a large tract of land between Erie and Organ avenues, the New York Central Railroad and the Buffalo & Lockport Railroad for the purpose.

The Gillie Engine Company, North Tonawanda, N. Y., is erecting an addition to its plant which will double its capacity.

The Martinizing Process Company, Tonawanda, N. Y., whose product is waterproofed paper and cardboard, will build an addition 42 x 200 ft. to its plant at Fillmore street and the Erie Railroad, and equip same with special machinery. J. H. Martin is president.

The Cuba Electric Company, Cuba, N. Y., which was incorporated for the purpose of operating a public service plant, will install an electric generating unit of 75 kw. for alternating current, together with exciter, switchboard and other power house apparatus, the principal contracts for which have been placed.

Among the contracts recently taken by the Ames Engine Company, Oswego, N. Y., are a number from the Pacific Coast, including a twin engine of large capacity to be installed by the Mineral Lake Lumber Company, Tacoma, Wash.

The Niagara Machine & Tool Company, Buffalo, is about to proceed with the erection of two buildings, 50 x 80 and 200 x 200 ft.

The American Gas & Electric Company, New York City, has purchased the plant of the Hartford City Lighting Company, Hartford City, Ind., and will replace it with a new power house of the most modern construction and equipment. No authoritative details have, however, been as yet announced.

The Barber Graphite Company has been incorporated at Glens Falls, N. Y., by Frank W. Wait and Chas. W. Hitchcock to manufacture graphite and carbon for various purposes.

The Interior Metal Mfg. Company has been incorporated at Jamestown, N. Y., capitalized at $50,000 and will engage in the manufacture of metal furniture. The directors are Gustaf Carlson, Oscar C. Carlson, Chas. A. Chindgren, Oscar Eckholm, Otto A. Nelson, F. August Rosenquist and Chas. J. Swanson, some of whom were formerly foremen at the factory of the Art Metal Construction Company. It is stated the new company is backed by ample capital and will at once equip a factory at East Jamestown.

The plant of the Kane Sliding Blind Company, Kane, Pa., destroyed by fire last week with a loss of $30,000, is to be rebuilt at once.

The Easton Rubber Mfg. Company, Easton, Pa., has taken over the plant formerly operated by the Easton Glass Company and will fit it up for manufacturing rubber goods.

E. S. Ward & Co., Waverley, N. J., manufacturer of leather goods, will erect an addition to their plant on Frelinghuysen avenue.

The Vulcan Hard Fibre Company has had plans prepared for a new plant which will be erected at Easton, Pa., which is the company's present address.

The Keiper & Heller Knitting Company, Easton, Pa., has made arrangements for erecting a large knitting mill at that point. It is understood some of the equipment is yet to be provided.

The Lackawanna Bridge Company, Buffalo, N. Y., has received contract for the erection of the new railroad shops to be built by the New York Central Railroad at Oswego, N. Y., and also for the shops to be built at Avis, Pa., by the same company.

Business Changes

The C. W. Hunt Company, builder of coal handling, conveying and hoisting machinery, has opened offices in the State Bank Building, Richmond, Va., and at 607 Rhodes Building, Atlanta, Ga., with W. F. Lee in charge.

The Interstate Pneumatic Tube Company, whose offices are at 200 Fifth avenue, New York, has leased 9840 sq. ft. of floor space in one of the Bush Terminal buildings and will at an early date move its office and plant to Brooklyn.

Manning, Fish & Co., 103 Park avenue, New York, building contractors, have changed their corporate name to Manning, Noble & Co. Charles L. Fish has severed his connection with the company.

Chicago

CHICAGO, ILL., June 28, 1910.

While there are no unusual deals pending and trade on the whole is quiet, there is a fair amount of business being done in the Chicago machinery market. Individual buying is quite satisfactory, as there is a good run of purchases of single machines. This business brings the dealers better returns than the estimates they submit on large lists, as the individual buyer is usually more interested in getting the machines exactly suited to his work than in shopping around for concessions in price. Along with this business there have been good sales recently of heavy tools and factory equipment. Several large local industries are pretty steady buyers to meet the growth in their business. Compared with a year ago conditions are really very satisfactory. Chicago houses are getting away from dependence on the automobile trade, and there is a peculiar undercurrent of satisfaction to be observed among the machinery men over the fact that they are able to exercise caution in booking automobile business. While it is not questioned that the large, well intrenched manufacturers of automobiles are traveling on safe ground, there is a revival of feeling that this business may be overdone next year. Among machine tool mannufacturers much complaint is heard about the difficulty in getting steel of the special grades used in machine tools. The mills which furnish cold rolled steel shafting are sold so far ahead that it is unusually difficult to get the material for orders in hand, and even smooth finish machinery steel is a scarce commodity. The scarcity of materials is responsible in many cases for the fact that the manufacturers cannot make deliveries for six to eight months on high class tools.

The American Bridge Company has recently purchased through its Pittsburgh office an extensive list of tools to equip the new fabricating shops at Gary, Ind. A large part of the business is being furnished by Chicago machinery houses, and it is evidently the intention of the American Bridge Company to have this plant in operation in the near future.

The specifications prepared by the mechanical department of the Chicago, Burlington & Quincy Railroad for the Havelock, Neb., shops have brought out much favorable comment from the machinery men who are figuring on this list. The shop experts in charge of this list seem to know just what they want, and their specifications are given in a precise form which simplifies the work of submitting estimates.

Chicago, Burlington & Quincy Railroad Havelock Shops Tool Equipment

One 50, one 30 and one 15 ton forcing presses.
One 36-in. vertical turret lathe.
One 30-in., two 15-in. one 51-in. and one 100-in. boring mills.
One 54-in. car wheel boring mill.
One cylinder boring machine.
One double head drilling machine.
One four-spindle drill.
One 24-in. and one 36-in. vertical drills.
Three centering machines.
One link radius grinder.
One 3-in. and one 1½-in. arbor presses.
One 24-in. gear cutting machine.
Two 24-in. gear planers.
One 6¼ x 26 in., one 4⅛ x 30 in. and two 2½ x 26 in. turret lathes.
One 24-in. shaper.
One 15-in. and one 18-in. slotters.
Two four-spindle turret lathes.
Two 22-in. drills.
Three 18-in. portable boring lathes.
One 20-in. and one 18-in. engine lathes.
Two 3 x 36 in. and two 3⅞-in. turret lathes.
One four-spindle staybolt drill.
Two 72-in. radial drills.
Four 24-in. post drills.
One 20-in. vertical drill.
Two power hack saws.
One 3½-in. drill grinder.
Four double head grinders.
One cutter and reamer grinder.
One die grinder.
One 12 x 40 in. universal grinder.
One six-spindle staybolt machine.
One 4-in. single head bolt cutter.
One 1-in. three-spindle bolt cutter.
One 1-in. four-spindle nut tapper.
One 100-lb. and one 200-lb. power hammers.
Two 1500-lb. steam hammers.

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One 100-in. quartering machine.
One cold saw.
One pipe bending machine.
Two pressure blowers.
Two 36-in. double punch and shears.
One staff riveter.
One horizontal flanging punch.
One 18-in. single end punch.
Two 18-in. single end shears.
Three double head dry grinders.
One 1-in. forging machine.
One rotary sand shifter.
One car wheel press.
One flue welder.
One tool, one babbitt, one brazing, two blowing out, one heavy forging and one case hardening furnaces.
One metal melting furnace.
One brass rattler.
One lifting magnet.
Two double head dry grinders.

The Marseilles Hydraulic Company, Ottawa, Ill., has been incorporated with a capital stock of $10,000, and will construct a hydroelectric power plant on the south side of the Illinois River at Marseilles, Ill., where it has acquired a 99-year lease on necessary property. It is expected that the work of construction on the plant will be commenced about September 1. Duncan McDougal is president of the company.

The Kaestener & Hecht Company, Chicago, manufacturer of elevators and conveying apparatus, will add to its plant at Jefferson and Desplaines streets by the construction of a seven-story and basement mill building, 50 x 80 ft.

The Weaver Mfg. Company, Springfield, Ill., has been incorporated with a capital stock of $15,000 to manufacture and deal in tools and machinery. The incorporators are I. F. Weaver, G. E. Weaver and Edna F. Weaver.

The Kokomo Brass Works, Kokomo, Ind., advises in regard to the recent fire at its plant that it only lost one day, the damage being confined mostly to stock. The damage to the building was very slight.

The North American Railway Specialty Company, Chicago, has been incorporated with a capital stock of $50,000 to manufacture and deal in railroad supplies and machinery. The incorporators are S. P. McGough, S. J. Cotsworth and Emmet M. Fry.

The South Chicago Architectural Iron Works, Chicago, has been incorporated with a capital stock of $10,000 to conduct a general iron, steel, cement and concrete construction and contracting business. The incorporators are Thomas J. Peden, Roy C. Merrick and F. B. Lurie.

The Elgin Damper & Heat Regulator Company, Elgin, Ill., has been incorporated with a capital stock of $25,000 to do a general manufacturing and merchandising business, the incorporators being F. C. Guptill and M. J. O'Neil.

The Harman Engineering Company, Peoria, Ill., will take figures on two centrifugal pumps driven by steam engines, two return tubular boilers, a small vertical boiler, feed water heater and electric lighting unit for a drainage plant at Carrollton, Ill. A steel stack for the furnaces is also to be built.

The authorities are considering substitution of motors for steam in operating the pumps in the water works at Monmouth, Ill., the necessary current being obtainable from the plant of the Monmouth Public Service Company.

The Fort Wayne Electric Works, Fort Wayne, Ind., has been awarded the contract for a large motor-generator set to be installed in the municipal power plant at Jacksonville, Fla.

The Ritchie Corrugated Culvert Company, Ottumwa, Iowa, has purchased a factory site in Muscatine, Iowa., and immediately upon the completion of a switch, which is being installed by the Chicago, Milwaukee & St. Paul Railroad, will begin the erection of factory buildings, which will be of structural steel and concrete construction. The company will install a power plant, together with air compressor and other improved machinery for the manufacture of sheet metal products. The company expects to commence operations in the new plant by November 1.

The Gregory Electric Company of Chicago reports unusually good business both for expert and domestic shipment. Among recent shipments were a carload of electrical machinery and engines to Sasga & Co., Tokyo, Japan; a 40-kw. General Electric generator and other equipment for Angarita & Co., San Cristobal, Venezuela, and a carload of 220-volt motors to Hicks Locomotive & Car Works, Chicago Heights.

The Clover Leaf Machine Company and the Yuester Axle & Transmission Company, South Bend, Ind., have been merged, making one of the largest automobile accessories plants in the State, with 22,000 ft. of floor space.

The Lexington Motor Car Company, recently organized at Connersville, Ind., has been incorporated, with $50,000 capital stock. The directors are F. N. Coats, E. D. Johnson, A. E. Leiter, J. C. Moore, H. S. Johnson, V. K. Dodge and G. D. Wilson.

The Forse Mfg. Company has been organized and incorporated at Anderson, Ind., with $6500 capital stock, to manufacture speed indicators. The directors are W. H. Forse, R. M. Allen and W. S. Ellis.

Charles Brunner, Peru, Ill., has incorporated his foundry, machine shop and boiler works under the title of the Brunner Foundry & Machinery Company, with a capital stock of $25,000. The company will operate along the same lines as heretofore, but will probably add to its gas engine department at a later date. No new equipment will be purchased at the present time.

The E. L. Essley Machinery Company, Chicago, has increased its capital stock from $25,000 to $50,000. This was decided upon at the annual meeting of the company, held recently, at which time it was found that the business is growing so rapidly an increase in capital would be desirable.

Philadelphia

PHILADELPHIA, PA., June 28, 1910.

Irregularity still marks the demand for tools and machinery in this territory. In a few instances a fair volume of new business is reported, but in the majority of cases both merchants and manufacturers state the demand is rather inactive. Here and there some business which has been under consideration for sometime has been finally closed up, one seller reporting a fairly good sale of lathes, the order for which was held up for some time. The trade has continued to give considerable attention to the convention of the American Association of Railway Master Mechanics, which closed last week at Atlantic City, so that the general trade has, in some cases, not been followed up as closely as usual. Considerable business is said to have resulted from displays of machine tools made at the exhibition held in connection with the convention.

The absence of any material lists of tools continues to be noted; usual inquiries cover principally single or small lots of tools, usually for urgent needs. Proposed extensions to automobile plants in this territory, as well as several other fair-sized tool requirements are being looked forward to by both merchants and makers of tools, but no real activity is anticipated in the immediate future. The national holiday and the usual midsummer stock taking and repairs will break into business during the next few weeks, and it is believed that, as is customarily the case, July will prove to be a rather quiet month.

Manufacturers continue well engaged, being pretty well fixed as to orders on hand, sufficient to keep them fully occupied for some time, and in instances during the entire second half of the year.

Export business shows a little more activity, but the bulk of the orders placed have been for special equipment. Rather quiet conditions are reported by dealers in second-hand machinery and tools.

The Nelson Valve Company, Wyndmoor, Pa., now has the steel work erected for a new steel foundry, a special Monel metal and alloy foundry, pattern shop and other additions to its plant. While the equipment for some of these buildings has been decided upon, a considerable quantity is still open and very few purchases have, it is said, yet been made.

The American Pulley Company reports a good demand for its new heavy service wrought steel pulleys, diameters 48 to 60 in. That for its regular line continues active, and a marked increase in the export trade is to be noted, shipments recently including good orders to India, Asia, Australia, South America and the Philippines. Current business is good, and the plant is being operated at capacity. The outlook for continued active business is considered satisfactory.

Various city departments have submitted estimates for requirements during 1911. From present indications no large amounts to be expended for machinery equipments are to be noted. The Bureau of Water proposes spending $600,000 on water supply betterment in West Philadelphia. The Bureau of Surveys asks, among other items, for $500,000 for new bridges; while the Department of Public Works includes an item of $150,000 for bridge repairs. Present estimates, however, are of a preliminary nature.

The Stone Harbor Electric Light & Power Company has been granted a charter under the laws of the State of New Jersey, with a capital stock of $100,000. The object of the corporation is to construct, maintain and operate in Stone Harbor, N. J., and the lower portion of Seven Mile Beach, electric light, heat and power plants. The incorporators named are H. I. Risley, David Risley, Charles A. Farnam and E. C. Waddington.

The Standard Pressed Steel Works has completed recent extensions to its buildings and will install machinery already purchased in the near future, which will greatly increase its productive capacity. June has been a comparatively good month in point of orders, and the first six months

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of this year show a material increase over any previous like period. The foreign demand for pressed steel shaft hangers has shown steady improvement and large consignments have recently been made to Austria, Canada and Australia. The domestic demand continues active and the plant is being operated at full capacity.

The Philadelphia Watch Case Company has awarded a contract to the William Steele & Sons Company, for the erection of a one-story brick power house for an extension to its power plant at Riverside, N. J.

George A. Smith, Essington, Pa., is reported to be building a new machine shop. The equipment of the present plant will be moved to the new shop on completion.

Bids will be received by the Committee of Sewage Disposal, State Hospital, Norristown, Pa., until July 8, for constructing a sewage disposal plant, laying cast iron and terra cotta pipe, constructing collecting wells and pump houses, and furnishing the necessary machinery. Plans may be seen at the office of the steward of the hospital, or at the engineers' office, Albright & Mebus, 908 Land Title Building, Philadelphia.

It is reported that F. H. Kaiser & Co., Pottstown, Pa., were awarded the contract for the erection of three brick buildings, which are to constitute the main portion of the new plant to be erected for the Chadwick Engineering Company of that city, manufacturer of Chadwick motor cars.

The Philadelphia Rubber Company will erect a warehouse building, 60 x 95 ft., three stories, at its plant at Thirty-seventh and Reed streets. An electric elevator of 3000-lb. capacity will be the only equipment required.

Dienelt & Eisenhardt, Inc., have recently taken several large orders for equipment of a special character, also orders for two large oilcloth printing machines, one of which is for export to Scotland. Orders for several Lovekin pipe expanding machines have also been booked, and recently one for the Charleston Navy Yard. This company has been very busy and is well covered with orders for future delivery. A number of new tools have recently been installed, and further purchases are contemplated.

Work has begun in Reading, Pa., on a three-story building, 25 x 40 ft., for the Grey Iron Foundry Company.

New England

BOSTON, MASS., June 28, 1910.

The Boston machine tool dealers have found June a very good month and are looking at the business situation with much hopefulness. A careful investigation reveals a normal condition hereabouts. The machine tool builders are busy. Many of them are rushed to their fullest capacity. In fact, practically every large concern has as much business as it can possibly handle with the existing supply of labor. That machine tools are in strong demand, taking the foreign and domestic market as a whole, is proved by the condition of the delivery sheets. While occasionally a slight improvement in this respect is noted, generally due to increased production, the average date of shipment is gradually but certainly receding. If, as the claim is made occasionally, the machine tool market is not good, it is difficult to estimate where deliveries will go to when the demand, taking the same basis, is really strong. The chief worry of the local dealers is regarding deliveries during the coming two years. They are quietly stocking up with second-hand equipment. Notable examples of far-sightedness in acquiring stocks of new machines are quoted.

A feeling exists that an effort is making by powerful interests to create disquietude. The daily press appears to be seeking less hopeful examples of industrial conditions, rather than to maintain a proper balance of commercial news. No concerted movement is afoot, probably, but the tone of the reports is based upon examples of depressed conditions to the exclusion of the much more numerous class of instances of prosperity.

The local market is more general than it has been. While the automobile, textile machinery, shoe machinery and electrical equipment manufacturers are still important factors, they predominate to a lesser degree. The demand is better in the vicinity of Boston than in western and central Massachusetts. Connecticut and Rhode Island retain about the same relative position as during the last three months. The supply trade is correspondingly active. June about averages up with April and May in both lines. Inquiries indicate to the dealers, according to their unanimous statements, that the summer business will reach normal proportions.

The crop situation in New England is exceptionally good, which should have an important effect in the buying of farming tools and machinery. Last year a serious drought caused losses aggregating millions of dollars to the agricultural community.

The Pneumatic Scale Corporation, Norfolk Downs, Mass., manufacturer of automatic weighing scales, has begun the erection of an addition to its shops, 35 x 110 ft., two stories, which will be devoted to manufacturing. Some new machinery will be required and will be purchased from time to time, but the amount will not be large at present, the company states.

Announcement is made at New Haven, Conn., that the plant of the New Haven Iron & Steel Company has been shut down and will probably not resume operations under the present ownership.

A new corporation, headed by W. Starling Burgess, Marblehead, Mass., will establish a plant at Newburyport, Mass., for the manufacture of aeroplanes. A tract of land has been acquired adjacent to the trying-out field of the Burgess machine, and a shop will be erected on the premises. At the present time the Burgess aeroplanes are built at the shipyard of the designer, Marblehead.

The Osgood-Bradley Car Company, Worcester, Mass., is increasing the working force of its new plant as rapidly as possible, close to 600 men being employed. Orders in hand warrant the full personnel of the shops of 1200 men. The company builds steam railroad and electric passenger cars. No definite plans have been made for installing equipment for building steel cars, but this department will be added later.

The Niles-Bement-Pond Company, New York, has been given the exclusive agency by the Becker Milling Machine Company, Hyde Park, Mass., for both vertical and horizontal milling machines for all Government and railroad work; for all horizontal milling machines, and for all vertical machines, excepting in Chicago and its immediate vicinity, which territory, as heretofore, will be handled by the McDowell-Stocker Machinery Company. The works of the Becker Company are rushed to full capacity, a condition which is deferring the bringing out of several sizes of the new type vertical machines. The shops will probably be much enlarged before the close of the season.

The attempt of the Grand Trunk Railroad to create a seaboard outlet at Providence, R. I., has developed into a sharp contest between that company and the New York, New Haven & Hartford Railroad as to which shall build an important link in Massachusetts, connecting Southbridge and Palmer. The Grand Trunk controls the Central Vermont line, which it proposes to tap at Palmer and build a line to Providence. The Rhode Island city is keen to have the plan carried to fulfillment, and the necessary rights have been obtained in that State. However, the Palmer-Southbridge link is necessary, and the competing company appears anxious that its territory be not invaded by the new-comer. Possibly the Grand Trunk can find some other means of accomplishing its purpose if the New Haven system succeeds in its effort. Shippers see an important advantage in admitting the Grand Trunk in the benefits of competing freights.

The new building of the Hart & Hegeman Mfg. Company, Hartford, Conn., manufacturer of electric switches, will be 60 x 200 ft., four stories, of brick, steel and concrete. Additional space is needed for manufacturing, and such space as is not occupied by the company will be rented. The company states that little new machinery will be installed.

The business of the Standard Electric Time Company, Waterbury, Conn., has been moved to Foxboro, Mass. The company, as well as the Standard Gauge Mfg. Company, is affiliated with the Industrial Instrument Company. The purpose of removing to Foxboro is to institute economies of manufacturing by consolidating equipment in the large plant already occupied by the Standard Gauge Company.

The E. L. Le Baron Foundry Company, whose works at Bridgewater, Mass., were burned recently, is erecting a foundry at Commercial Yard, Brockton, Mass., where a line of machinery will be manufactured, as well as job castings. The building will be 60 x 80 ft.

The interesting announcement is made that the Connecticut Company which controls a large division of the electric lines of the New York, New Haven & Hartford Railroad, will build a large addition to its repair shop at Fair Haven, a suburb of New Haven, Conn. According to the dispatch, a portion of the present shop will be torn down and the offices shifted to other quarters, and the entire group of buildings will be devoted to repair purposes. The addition will be 61 x 104 ft., two stories, of brick and steel construction. Work will begin immediately.

The plans of the Hartford Electric Light Company, Hartford, Conn., for increasing its power facilities at Dutch Point, involve the expenditure of $400,000. New steel and concrete buildings will be erected, in which will be installed two 5000-kw. Curtis turbines, together with the necessary electric generating generators and boilers and the other ap-

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purtenances of the large units. The Westinghouse, Church, Kerr Company, New York, have the contract.

The Scovill Mfg. Company, Waterbury, Conn., will erect a factory building, 55 x 60 ft.

The McCue Company, Hartford, Conn., manufacturer of automobile and carriage parts, will erect a one-story addition, 42 x 102 ft., with saw tooth roof, for use as storage, the purpose being to release space in existing structures for manufacturing.

Moody & Almon, Montpelier, Vt., are developing the water power of Mad River. A dam is under construction, from which water will be carried through an iron penstock 1000 ft. long to the power station, where 900 hp. will be created in electric energy, which will be sold to users.

The machinists' strike of Boston and vicinity has not extended to the machine tool builders, being confined to those who use machine tools for general manufacturing. The affected shops are replacing the strikers and have begun the return to a normal condition. The union demands a minimum wage of $3, with a nine-hour day, to be made an eight-hour day after a year. A threatened foundry strike at Hartford, Conn., was confined to patternmakers, who have either returned to work or found their places occupied by new men.

The auction sale of the equipment of the New England Marine Engine Company, Noank, Conn., brought very good prices, some machine tools of the classes where deliveries are distant selling at high figures. One milling machine which sold second hand for $450, several years ago brought $525, the present new price being $695. In this connection it is interesting to note that a second-hand miller sold several years ago for $650 is being held by its owner at $725.

The Worcester Consolidated Street Railway Company, Worcester, Mass., is contemplating the establishment of a power station at Millbury, Mass., at a cost of $300,000.

The Connecticut Company, Bridgeport, Conn., has awarded the contract for a trolley line between Bridgeport and the neighboring town of Stratford to cost $48,000.

The city of Westfield, Mass., is contemplating increasing the municipal gas works from a daily producing capacity of 75,000 to 125,000 cu. ft.

Additions to general manufacturing establishments include the following: B. Lipman & Son, Hartford, Conn., brick factory 32 x 75 ft., two stories; Woonsocket Worsted Company, Woonsocket, R. I., addition to spinning mill, 50 x 80 ft., three stories; Sharp Mfg. Company, New Bedford, Mass., new cotton company with $1,500,000 capital stock to erect mills with a capacity of 90,000 spindles, with Joseph T. Kenney as president and Arthur R. Sharp, treasurer; Puritan Mills, Fall River, Mass., new cotton company with $50,000 capital, directors having authority to award building contract, Herman G. Myer being the president and Edwin N. Blinn treasurer. Another cotton mill project is that of Eben C. Willey, Fall River, Mass., to establish a plant at North Fair Haven, Mass.

The Johnson Educator Food Company states that its increase will be at the present location, Newburyport, Mass., and not at Mansfield, Mass.

Cleveland

CLEVELAND, OHIO, June 28, 1910.

While dealers generally report a good volume of business in prospect actual sales during the past week were light. Quite a number of new inquiries for small lots of tools have come out, but buyers as a rule seem to be in no hurry to place their orders, and trade is dragging more than it has for some time past. The business in prospect, for which machinery houses have not yet received inquiries, is largely for equipment for new plants and additions, which will not be needed until along in the fall. Very little inquiry is coming from the railroads. Two lists from that source that are expected in this territory have not yet come out. Orders at present are mostly for small tools. The demand for second-hand tools is fair.

Orders for automatic screw machines are not as numerous as they were some time ago, owing to the fact that the automobile trade has not done much buying lately, but the demand for turret lathes is quite active. There is a fair foreign demand for the latter, which appears to have improved. Orders for heavy forging machinery have fallen off considerably, this being attributed to the absence of railroad buying. The call for pneumatic tools is fair. Orders for small motors, which have been rather scarce recently, show a little improvement. Mine hoist inquiries have become quite active.

The demand for equipment for water power plants which has been good for some time past continues very active. The Wellman-Seaver-Morgan Company, Cleveland, has just received an order for a 6000-hp. unit from the Calgary Power Company, Calgary, B. C., and is figuring on a number of inquiries for water wheels from various sections of the United States. This company also reports the receipt of a large number of orders for mine hoists for Western and Mexican mines. Among other new orders taken is one from the Republic Iron & Steel Company for four Hughes gas producers for its soda pits at Youngstown, Ohio, and one from the Cambria Steel Company for four gas producers.

The Cleveland Steel Tool Company is in the market for machine tool requirements for its new plant, having an inquiry out for one plain and one universal milling machine, a 16-in. lathe, a radial drill, cutter and tool grinder.

Plans for a new plant to be built by the Seneca Chain Company to replace the one at Kent, Ohio, that was destroyed by fire a few months ago, are being prepared by the Cleveland Engineering Company. The new plant will be the same size as the old one. The Seneca Chain Company will also make some improvements and possibly additions to its Mansfield, Ohio, plant.

The A1-Ton Motor Accessory Company, recently incorporated at Akron, Ohio, with a capital stock of $50,000, has effected its organization by the election of the following officers: C. S. Pelton, president and general manager; H. F. Maranville, vice-president and engineer; C. H. Maranville, secretary, and Harry Williams, treasurer. The company will manufacture an automatic oil filtering and lubricating device for automobiles and a motor car heater. The company has commenced the manufacture of its products in a plant that it has leased on South street.

The Akron Rotary Engine Company, Akron, Ohio, has been incorporated with a capital stock of $10,000 by C. E. Forsyth, Leo G. Federman, I. M. Forsyth, A. Federman and A. S. Mottinger.

The Diamond Alkali Company of Pittsburgh, Pa., will issue $75,000 worth of bonds, the proceeds to be used in erecting a $1,000,000 soda ash plant near Fairport, Ohio.

Another large factory in Akron, Ohio, for the manufacture of tires and other rubber goods is promised in the formation of the Portage Rubber Company, capitalized at $1,000,000. Options have been secured on several sites for the plant.

The Niles Forge & Mfg. Company, Niles, Ohio, which recently built a new plant, has increased its capital stock from $20,000 to $30,000.

The City Council of Toledo, Ohio, has authorized Director of Service Cowell to purchase an auxiliary pump and motor for the municipal filtration plant in that city.

The Electric Welding Products Company, Cleveland, has moved into its new factory addition, which is 94 x 100 ft., three stories. The company manufactures automobile specialties and employs over 300 men.

The B. & O. R. R. now has under construction a new ore dock at Lorain, Ohio. Power for operating the unloaders will be supplied by a 300-kw. synchronous motor generator set recently purchased from the Allis-Chalmers Company. This will receive alternating current at 440 volts three phase 60 cycles and deliver direct current at 250 volts.

Pickands, Mather & Co. recently placed an order with the Allis-Chalmers Company for two 300-kw. 250-volt 150-rev. per min. engine type direct current generators to supply power for ore unloaders at the new N. Y., P. & O. ore dock at Randall, Ohio.

Cincinnati

CINCINNATI, OHIO, June 28, 1910.

Buying in spots is still a characteristic feature of trade in this district. This estimate is made from the reports of the larger concerns making specialties of tools or appliances. The plants with limited capacity report business but fair.

As many large establishments are closing their fiscal year this or next month, it is a season of computation and comparison, and the figures furnished by Secretary Manley of the Metal Trades' Association are at this time particularly interesting. These figures show progress toward recovery in the manufacturing district, and indicate that on June 15 operatives employed and output had reached 92 per cent. of normal, taking June 15, 1907, as the basis, and figuring that record as 100 per cent. The record on March 15 this year was 89 per cent. The minimum of output and operatives employed was reached on September 15, 1908, when the records showed 53 per cent.

A somewhat peculiar feature of the local machinery market is the apparently conflicting reports from machine tool manufacturers and the foundrymen. While the majority of the former are busy almost to their high speed records of 1907, it is a very rare occurrence to find a foundry plant operating to more than half cupola capacity, and those making a specialty of machine tool castings are complaining of the dearth of orders. June, July and August, 1907, was a uniformly boom period with foundrymen in this district and

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represented the high water mark of castings output. Milling machines, upright drills, some special lathes and planers continue the most popular sellers in the tool field, and with all these, foreign business is reported to be improving. In certain sizes of two or more of these standard tools business is being booked for October and November delivery, as the best that can be done.

A feature of lathe production in this field is the tendency of owners of plants to enlarge and improve. The Lodge & Shipley Company, making lathes a specialty, has taken out a permit to build a three-story structure for its pattern shop to cost about $7500, and are also finishing a commodious addition to its drafting quarters in the main building. The R. K. Le Blond Machine Tool Company has their new addition in the East end about half completed. The Sebastian Lathe & Tool Company has recently finished a new addition which greatly enlarges their capacity.

Officials of the International Harvester Company have been in Springfield, Ohio, arranging for the enlargement of the company's factory in that city. Four additions are to be built which will practically double the producing capacity of the Springfield plant.

The Cincinnati section of the Associated Foundry Foremen met at the Grand Hotel, on June 25. President Herbert M. Ramp of the Modern Foundry Company gave a splendid talk on the Detroit convention of the foundry interests, and a number of others were heard from.

The National Chamber Oven Company is a new incorporation for Elmwood place, Cincinnati, by J. E. Stacey, R. J. Tarvin, A. J. Wacer, Wayne Stacey and Wm. F. Dunker; capital, $10,000.

Springfield, Ohio, capitalists have induced the Taylor-Steel Company of Plain City, Ohio, to build and maintain in that city a plant for the manufacture of crucible steel forgings. A location in the west end of the city was selected and a building will be erected at once.

The new machine shop in course of construction in Fort Wayne, Ind., for the Fort Wayne Electric Works is expected to be completed by fall. The new Wall street plant is to be started as soon as the roof is on the new building.

Announcement has been made that Dayton capitalists interested in an invention of William Rodgers of Conover street, that city, will finance a proposition to erect a foundry building to make iron by the process discovered by Mr. Rodgers. The process is said to revolutionize the making of razors, dental and surgical instruments, milling machinery, &c., in that ordinary gray iron and scrap will be used.

The Sterling Metal Mfg. Company, Cincinnati, has been incorporated for $50,000 by Christian Keck, Elex Dom, Harry H. Hyams, Alfred Cohen and Alfred Mack. The company will manufacture metal filing cases and office appliances by a new process patented and owned by it.

The Lunkenheimer Company, Cincinnati, is in the market for two gas engines of 200 hp. each, to be used in connection with natural gas and producer gas. They are to be direct connected to alternating motors for furnishing heat and power at the company's plant in North Fairmount, and constitute an addition to its already large power, light and heating plant. The purchasing department is busy checking up recent purchases of equipment for the large brass foundry building, which is to be ready within six or eight weeks; these include brass working lathes, boring mills, molding machines, ovens, &c.

The Cincinnati Planer Company, Cincinnati, reports quite an improvement in its foreign business, and during the present month has booked orders from Siberia, Germany, Holland, Italy, Mexico, Cuba, South America and Canada; also some large orders from prominent concerns in the United States. The prospects for a big year are very good.

Pittsburgh

PITTSBURGH, PA., June 28, 1910.

Hot weather has had a depressing influence on the local market, and there is delay in making quotations, estimates, &c., as well as lessened activity all along the line. The shops, however, are still filled with work. Thus far no evidence of future slackness has appeared, and every indication points to a continuously busy summer. Machine tool dealers have some good lists in prospect, and there are scattered inquiries from manufacturing plants in the district which bring a fairly steady volume of trade. Buying for delivery in the fall and early winter is already in progress, with some bookings even further ahead. Second-hand machinery of various kinds seems to be in considerable demand. A good deal of this has gone lately to the smaller coal mining companies of the bituminous districts, including power and pneumatic equipment, hoists, tipples, &c., for new operations. Owners of the more important collieries continue to purchase quite freely from manufacturers of the best modern types of mining and handling machinery, and their requirements will be large for some time.

The Biwabic Mining Company, Youngstown, Ohio, which installed about 15 years ago, at its property on the Mesaba range, what was then the largest gyratory breaker built—namely, a No. 9, has again ordered one having the widest opening of any thus far manufactured, or 48 in., which is designated as a No. 24. The mine is an open pit which contains veins of very hard iron ore and tacinite.

Work is about to start on the new manufacturing plant to be erected for the Ansted Spring & Axle Company, at Connersville, Ind. It will comprise three factory buildings, 60 x 200, 60 x 120 and 70 x 150 ft., of brick and steel construction. The contract has been let to the Pan-American Bridge Company, New Castle, Ind.

The Charleston Electrical Supply Company, Charleston, W. Va., has taken a contract from the Memphis Mining Company of that city for equipping its new power plant at Island, Ky. The machinery will include an engine of the McEwen type, built by the Ridgeway Dynamo & Engine Company, Ridgeway, Pa., coupled to a 300-kw. direct current generator, with switchboard and auxiliary apparatus. The power generated will be used for mining, haulage, surface work and lighting.

Arrangements have been made by the Oakland Electric Light Company, Oakland, Md., to install an engine of 125 hp. to operate on natural gas. Westinghouse generators driven by steam engines are now in service.

A two-story factory building is about to be erected in Glassport, Pa., by the United States Glass Company, Pittsburgh.

The New Idea Spreader Company, Lima, Ohio, will erect a large new factory for the manufacture of agricultural machinery. The details of structure and equipment have not yet been fully worked out.

The Liberty Mfg. Company, Pittsburgh, recently had on exhibition at the California State convention of the National Association of Stationary Engineers, in Los Angeles, one of its pneumatic water tube boiler cleaners, which attracted a great deal of attention.

A side product of the Burch Plow Works, Crestline, Ohio, which has been taxing the available foundry capacity this season, is a cast iron adjustable sewer inlet, that sells largely to municipalities.

The Pittsburgh sales office of the Rensselaer Mfg. Company, which is in the House Building, finds that there is a growing demand for electrically operated valves, which are gradually displacing other types in pipe lines for oil, water, gas, steam or compressed air. The company's designs include all sizes up to the largest, and valves are furnished to meet any pressure. The factory is at Troy, N. Y.

Thomas Watkins, Johnstown, Pa., is putting on the market a very efficient type of pipe jointer.

The Riverside Bridge Company, Martin's Ferry, Ohio, has the structural contract on a new machine shop, 100 x 750 ft., to be built by the Ford Motor Company, Detroit, Mich.

Additional power will be required by the Portsmouth Street Railway & Light Company, Portsmouth, Ohio, upon the completion of a projected extension of its lines. The purchase of some new equipment will be involved in due course.

The W. H. Miller Mill & Mine Supply Company, Columbus, Ohio, will erect a machine shop building some time during the summer.

The construction of a modern, high duty pumping plant, which has been under consideration for some time at Urbana, Ohio, will probably be undertaken in the early future, as the necessary funds are now being provided.

Structural steel contracts have been let for the new plant of the Pittsburgh Plate Glass Company, at Ford City, Pa. Electric power with which to operate the machinery in the works will be furnished by gas engine driven generators.

Heyle & Patterson, Inc., Pittsburgh, are in the market for a second-hand electric traveling crane of 5 to 10 tons capacity and 40 to 60-ft. span.

The Mesta Machine Company, Pittsburgh, is operating its plant at West Homestead, Pa., to full capacity. The company has important contracts on its books for steel castings, sand, chilled and steel rolls, machine molded pinions and gears, &c. Shipments made the last week or so include the following: Forged Steel Wheel Company, Butler, Pa., one 800-ton motor driven billet shear and gauge and a special No. 5 motor driven roll lathe; John Mohr & Son, Chicago, two 400-ton metal mixers for the Indiana Steel Company, Gary, Ind.; Tennessee Coal, Iron & Railroad Company, Ensley, Ala., tilting machinery for two 30-ton open hearth furnaces; Bethlehem Steel Company, South Bethlehem, Pa., one stand of 52-in. pinion housings.

Frank E. Price of the McCrum-Howell Company, Union-

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town, Pa., has opened an office and show room at 114 Seventh street, Pittsburgh, where a line of Richmond boilers, radiators and enameled ware is carried.

Vollkommer & Co., Empire Building, Pittsburgh, owners of the Vitro Mfg. Company, manufacturer of enameling material, have prepared plans for a 45 x 60 ft. addition to the plant at Sheridan, Pa. The new building will be of brick and steel construction, and will be built during the summer.

Detroit

DETROIT, MICH., June 28, 1910.

While conditions lately have been far from uniform, manufacturers throughout this section are doing a very satisfactory business. In the foundries, metal working shops and industrial plants generally production keeps up to a high notch; and, while sales do not show quite as good an average, they are fully as large as the trade has any reason to expect at this season of the year. If approximately the same level is maintained, there will still be work enough on hand by the time autumn activity has developed to keep the market in a strong, healthy condition. It is anticipated by dealers whose predictions have found verification in the past that there will be a gradual stiffening of prices during the latter part of the year, and that deliveries will be more and more extended. Most of the orders that are now coming out are for single tools or small lots, even where the customer has a long list of purchases to make. The automobile trade, including makers of parts and accessories, still figures the most prominently in the buying. Electrical equipment is wanted. Generating units of moderate size have recently been in the greatest demand, with both direct and alternating current motors in lots of 5 to 30, as well as numerous single machines. Automatic control apparatus is being given more attention than formerly, due to the necessity for using so much unskilled labor. In this connection, also, the statement recently made by Robert Pierpont, factory manager of the Olds Motor Works, to the effect that the automobile trade needs simpler machine tools with fewer feeds and speed changes, is emphasized daily by the difficulty of securing enough competent mechanics to properly operate the machines now in service.

An addition of considerable size will be made to the plant of the Michigan Screw Company, Lansing, Mich.

Contracts have just been let for the construction of the new Detroit factory of the Alden-Sampson Company, which is to be 150 x 1000 ft.

The Smith-Winchester Company, Jackson, Mich., is having plans prepared for a factory building, 60 x 130 ft.

The France Company, Bloomfield, Ohio, will install in its crushing plant at Holland, Ohio, a No. 9 gyratory crusher.

The new rockhouse of the Lake Copper Company, Houghton, Mich., is to be equipped with a traveling ore sorting table, of which it is said that it will enable two or three men to handle all the work of sorting out the worthless gangue and feeding the ore bearing quartz to the crushers, which formerly took quite a large force. It will be constructed of heavy steel chains, moving like an endless belt.

The authorities at Monroe City, Mich., have engaged engineers to prepare plans for a pumping plant, water and sewage system.

Some additional mechanical equipment will probably be required this year for the filtration plant at Toledo, Ohio, in connection with provision to be made for enlarged capacity.

The MacKinnon Boiler & Machine Company, Bay City, Mich., in addition to the boilers, engines and other machinery of its manufacture, is building up a large business in the erection of steel refuse burners. These are made water jacketed.

The Voelkner & Harry Mfg. Company, Detroit, is proceeding with the erection of a new factory building, the equipment for which has been mainly purchased.

The Russel Wheel & Foundry Company, Detroit, has the contract for building a new forge shop that is to be added to the plant of Dodge Brothers, whose purchases of equipment were recently mentioned. It will be one story, 70 x 400 ft.

The Jackson, Church & Wilcox Company, Saginaw, Mich., has made final arrangements for the construction of a manufacturing plant.

The triple expansion pumping unit installed at Muskegon, Mich., by the Platt Iron Works, Dayton, Ohio, which has a rated capacity of 6,000,000 gal. in 24 hours, and consists of a vertical, triplex, single acting pump, driven by a four-cylinder engine, operated condensing, has been found on test to exceed its guarantees by about 10 per cent.

Whitehead & Kales, Detroit, are the successful bidders on the structural work of a group of factory buildings to be erected for the Kelsey Wheel Company of this city, an extension of whose facilities has been necessitated by the increasing demand for the automobile parts which they manufacture.

The W. B. Mershon Company, Saginaw, Mich., has installed one of its 66-in. vertical resaws in the plant of the Old Oregon Mfg. Company, Anacortes, Wash., making the third of this type in use there.

The Gaylord Motor Car Company, Gaylord, Mich., whose plans for a factory were recently referred to, is now making arrangements for the construction of the necessary buildings. Equipment has not yet been purchased.

The city of Sturgis, Mich., is about to start work on the dam and power house of its hydroelectric plant, the details of which have been previously given.

The Bryant Paper Company, through its consulting engineer, D. J. Albertson, Kalamazoo, Mich., will soon let contracts for additional machinery.

The Imperial Furniture Company, Grand Rapids, Mich., has had plans drawn for a four-story addition to its factory. The new structure will be 60 x 180 ft.

The Daigle Iron Works, Detroit, has taken the structural contract for the new factory building of the Swift Auto Company.

Work is about to begin on the erection of a manufacturing building, 40 x 150 ft., for the American Metal Screen & Rack Company, Detroit.

A direct current generator of about 75 kw. capacity will be installed in the plant of the Schroeder Headlight Company, Evansville, Ind.

The Bessemer Gas Engine Company, Grove City, Pa., recently installed three Northern type E electric traveling cranes, two of them being of five tons capacity, the other a 25-ton, four-motor, 60-ft. design, made by the Northern Engineering Works, Detroit.

The management of Agnew Electric Welding Company of Detroit is now in the hands of Cleveland men, active in the management of the Electric Welding Products Company, who have bought out the Agnew interests. The officers of the company are: C. E. Thompson, president; J. A. Krider, vice-president; R. K. Loofburrow, secretary and treasurer. The company will add to its facilities and expects shortly to move from its present location, No. 868 Military avenue, to more suitable quarters.

The Alpena Motor Car Company, Alpena, Mich., has filed articles of incorporation, with a capitalization of $450,000. The company has secured a site from the city of Alpena, upon which it will erect a factory. The first year's output will be 1000 cars, most of which have been contracted for. The officers of the company are: D. D. Hanover, president; William Krebs, vice-president; W. B. Robertson, secretary and treasurer.

The Clayton-Lambert Mfg. Company, Detroit, manufacturer of plumbers' supplies, has just completed an addition to its plant which will increase its capacity about one-third.

Work on the new factory of the Reynolds Motor Company, Detroit, Mich., is progressing rapidly, and when this new plant is completed it is the intention of the company to abandon its present quarters.

Milwaukee

MILWAUKEE, WIS., June 27, 1910.

The volume of business actually transacted during the past week is not as large as previously reported, but this has been due more to the extreme heat than lack of opportunity. The work in the shops also has suffered in a corresponding degree. There is, however, a great deal of estimating now being called for, and most manufacturers have quotations out in all parts of the country as well as abroad. Much of this business is not likely to be closed until late in the summer, but some inquiries which were only recently made have developed into orders sooner than was expected, and the same tendency, if continued, may alter the situation materially. It is already apparent that there can be no dull summer in the ordinary acceptance of that term.

Orders for power and electrical machinery are again running mainly to the smaller sized units, and motors ranging in capacity from 1 to 20 hp. form a larger percentage than ever of total sales. The generating units now being purchased, as well as the motors, appear to be principally for the account of the industrial establishments of various kinds. This is noteworthy for the reason that most of the buying during the spring was done in behalf of municipalities and public service companies; hence current business is an excellent indication of the expansion of manufacturing facilities which is taking place at this time in every branch of industry.

Another sign of the greater activity impending is also to be found in the fact that all of the engineering firms, mill architects and construction companies who make a

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specialty of factory design and erection are crowded with work. They have in most cases been compelled to add largely to their staffs, and it has become increasingly difficult to obtain suitable men for the more responsible positions. The preparation of specifications also lags perceptibly in consequence of this condition, and quite a number of purchases for fall delivery which were to have been made during the month of June are still being put off until the details of shop arrangement and equipment have been more fully worked out. This is a factor which, in its influence upon the summer's trade, should not be overlooked. It behooves dealers to keep more closely posted than ever with reference to the progress of plans for new factoris or plant additions, for the reason that after being delayed, as above indicated, their completion is apt to be followed by rush orders for such machinery as could not be positively determined upon in advance without the usual time allowance for obtaining bids in a number of different quarters.

Among the municipalities of Wisconsin and adjacent States, due largely to the recent efforts of the public health authorities in pointing out the dangers of impure water, there has been considerable activity awakened in respect to better means of supply. Accordingly, the market for pumping machinery has broadened out, and there is better opportunity than formerly for the sale of various auxiliaries which have heretofore been dispensed with, the object now being to obtain reduction of operating expense through increased plant economy. There are many plans being formulated at various points in the Northwest which will be put into execution early in the autumn. In some localities deep-well pumps, lifting water to elevated steel storage tanks or standpipes are coming more into favor; and sales of apparatus of this character are practically certain to be doubled or trebled within the coming year. Air compressors for increasing the pressure in the mains, both for the purpose of extending the latter over wider districts and for better fire protection, will also be called for much more frequently in future than they have been at any time prior to this season. The field is one which will well repay careful investigation and close canvassing for business.

W. J. Hess, who has been manufacturing brass and iron valves at another point in Wisconsin, is to build a new plant at Green Bay, Wis., and will remove to that place the machinery now operated. Some additional equipment will also be required as soon as his plans have been fully formulated.

The American Mfg. Company, Sheboygan, Wis., is building a four-story addition to its plant. This may involve the purchase of woodworking machinery, although the company's needs in this line appear to have been filled for the present.

The Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., has finally let contracts for the construction of new buildings, 82 x 110, 150 x 252, 80 x 115 and 220 x 378 ft. The Wisconsin Bridge & Iron Company, North Milwaukee, Wis., will furnish the structural steel.

Work will begin shortly on an addition to the factory of the Broecker Paper Box Company, Racine, Wis. No information as to equipment details has as yet been given out, but it is understood locally that one or more presses and some light operating machinery have already been purchased.

The Janesville Machine Company, Janesville, Wis., is erecting an addition to its foundry, the equipment of which will include a 10-ton cupola furnace, monorail crane and hoist, motor-driven blower, &c. Most of the apparatus needed was ordered about two weeks ago.

Contracts are now being let for two new three-story buildings, 40 x 60 and 40 x 100 ft., to be erected for the Northern Casket Company, Fond Du Lac, Wis. Boilers and other power equipment, including electric motors, will be needed for operating the machinery, some of which is still to be purchased.

The Rock River Machine Company, Janesville, Wis., has ordered from the Milwaukee Bridge Company, Milwaukee, structural steel for a new shop building, the equipment of which is largely provided for.

Bids have just been taken for the account of the Kempsmith Mfg. Company, Milwaukee, on buildings for its new West Allis plant, and the work will be pushed to completion as soon as all of the arrangements can be made. The works will include a one-story machine shop, 250 x 300 ft., with saw-tooth roof; one-story pattern shop, 50 x 90 ft., one-story power house, 50 x 100 ft., and a large office building, all of which are to be of brick and steel construction with concrete foundations. A steam-electric generating plant will be installed and motors used for driving the machinery.

The Hummel & Downing Company, Milwaukee, has decided to proceed with the erection of its new plant, which will be the largest of its kind in the Northwest. The initial unit is to cost $350,000. The purchase of machinery is now being arranged for.

The Milwaukee Electric Railway & Light Company is preparing to add steam turbine units of approximately 45,000 kw. to the equipment of its Commerce street power plant in Milwaukee. The first of the new machines to be installed will aggregate 15,000 kw. and the probabilities favor the selection of a Curtis turbine set of the General Electric Company's build, inasmuch as vertical machines of that type are already in service at the station, and take up very little room for their capacity.

The La Crosse City Railway Company, La Crosse, Wis., has made a contract with the La Crosse Gas & Electric Company to furnish power for the operation of its lines, and it will be necessary for the latter to install additional equipment. The details of the plant, however, have not yet been fully worked out.

Boiler makers here will figure on a battery of three water tube boilers aggregating 750 hp. to be installed in the city pumping station at Muskegon, Mich. Bids will be taken by the municipal authorities until July 5 or possibly later.

The Badger State Machine Company, Janesville, Wis., is putting out a line of combined power punches and shears in five sizes.

The Bucyrus Company, South Milwaukee, will hereafter manufacture the Heyworth-Newman excavators under exclusive patent rights, and is now arranging for a large annual output.

The Edgerton Wagon Mfg. Company, Edgerton, Wis., is now building a new plant, 50 x 210 ft., which will be electrically operated throughout.

The Milwaukee Bridge Company has the contract for a new steel bridge to be built for the city at Streator, Ill.

The new foundry and shop in process of erection at Kilbourn, Wis., for the Kilbourn Specialties Mfg. Company will soon be ready for operations. The machinery for the finishing department is now in process of installation. Some additional equipment will be required as the needs of the business develop.

Manufacturers here expect to furnish some machinery for the new plant to be erected at Sandusky, Ohio, for the Auto Parts & Motor Truck Company, which will be in operation by early fall. The plans are said to include motor drive.

The authorities at Fond du Lac, Wis., have awarded the contract for a new steel bridge to the Kelly-Atkinson Construction Company, whose address is given as Chicago, Ill.

It is reported from Racine, Wis., that arrangements for the addition to be made to the foundry of the Racine Brass & Iron Company will be completed in the near future; but no definite statement on the subject has as yet been given out and the plans for this extension do not appear to have been fully formulated.

The Mineral Point Zinc Company, which is adding to its smelter at Mineral Point, Wis., will soon have facilities available for the treatment of 100 tons of ore daily. All of the equipment needed at present has been ordered, but this company will be one of the largest buyers of the district in future of mechanical appliances and spare parts of various kinds.

A new factory, 38 x 100 ft., with warehouse, 48 x 100 ft., and other structures to be added later, will be built at West Salem, Wis., by the newly organized West Salem Canning Company. It is reported that all of the equipment, exclusive of boilers and power machinery, will be furnished by the Sprague Canning Machinery Company, Chicago, Ill.

The Dickson Malleable Iron Company has placed an order with the Milwaukee Boiler Company for two 150-hp. boilers and with Allis-Chalmers Company for a 150-kw. belted generating unit for supplying electric power and lighting to the new plant which it now has under erection.

Bids are being taken by the Foster Construction Company, Milwaukee, for material to be used in the new plant of the Milwaukee Machine Tool Company, a site for which was recently secured in West Allis. Work will begin early in July. It is understood locally that some of the equipment which will be necessary, in addition to that now in service at the company's present factory, has already been purchased.

A large timber cutting and woodworking plant is to be erected at Phillips, Wis., by the John R. Davis Lumber Company.

The Campbell Magnetic Separating Company is completing a new ore reduction plant near Cuba City, Wis., at a point between that place and Benton, which will be one of the best equipped in the zinc mining district. All of the machinery is to be motor driven and the contract for electric power has been made with the Interstate Light & Power Company, Galena, Ill.

The Allis-Chalmers Company has taken the contract for a 1500-kw. steam turbine set to be installed at the municipal power plant in Jacksonville, Fla.

The capacity of the city pumping station at Joplin, Mo., will be doubled shortly by placing in service a pumping engine of 7,000,000 gal. daily capacity, which was built in the West Allis, Wis., shops of the Prescott Steam Pump Company.

A pumping unit of 1000 gal. per min. capacity, fur-

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nished by the Byron-Jackson Iron Works Company, West Berkeley, Cal., which built the machinery now in service there, will be installed at the water works in Green Bay, Wis. It is required to lift water to a standpipe from a 1000-ft. well.

George H. Benzenberg, who was for many years city engineer of Milwaukee, has been engaged by the authorities at Kansas City, Mo., to act as consulting engineer in connection with projected improvements to the water works there, particularly at the Quindaro pumping station, the principal equipment for which, as it at present exists, was built in Milwaukee.

The Stroh Die Moulded Casting Company, Milwaukee, is erecting a building 100 x 120 ft., eight stories, to be used for light manufacturing.

The Southwest

KANSAS CITY, MO., June 27, 1910.

Except in the line of machinery for power and pumping plants, municipal improvements of various kinds and construction work generally, trade at present is not very brisk, having slackened perceptibly since last reported. The buying is of a desultory character, being dictated more by current needs than by regard to future requirements. This, however, is not to say that a period of settled dullness has come upon the markets of the Southwest, for there are plans now pending which will be liable to cause a heavy round of purchasing at any time, particularly as fall approaches. At most points the heat lately has been so intense that any work which could be put off until weather conditions are again more comfortable has been temporarily suspended. It is also difficult to get sufficient labor, and among the skilled workmen in shops and factories, as well as on construction gangs, the sick list has been uncommonly large. Contracts previously let are, therefore, being delayed in execution, and the effect is felt in diminishing competition for work now offered, as few concerns manifest any great desire to take on more than they have already booked.

The Vinita Light & Power Company, Vinita, Okla., will increase the capacity of its electric generating station. Two new power units, one of 250 kw. and the other of 100 kw., together with a considerable line of subsidiary equipment, are to be installed. The prime mover for the larger machine will be an 18 x 36-in. heavy duty Corliss engine.

Some additional equipment will be provided in the near future for the city pumping station at Eureka Springs, Ark.

The bids recently taken by the city of Dallas, Texas, for air compressors to be used in connection with deep well water service have been rejected and new tenders called for.

Representatives of the Fred M. Prescott Steam Pump Company, who make El Paso their headquarters for the Southwestern trade, are finding the best field of sales at present among the mining and development companies of New Mexico, Arizona and old Mexico.

Pumping machinery of large capacity will be required for installation at El Reno, Texas, when the new municipal water works are constructed. Funds for the purpose have just been provided, but the plans are not yet drawn.

The Arizona Prospecting & Developing Company, Wickenburg, Ariz., is reported to be in the market for an air compressor and drills. Later on concentrating and ore reduction machinery will be required.

The Sonora Central Mines Company, Alamos, Sonora, Mex., is about to install a line of frue vanners and other equipment.

Pumping units of moderate capacity will be required shortly for the new municipal water works system at Republic City, Kan.

It is proposed at Arkansas Pass, Texas, to issue bonds for building a pumping plant. A vote on the question will be taken in the near future.

Construction of water works, with consequent need of pumping units and other equipment, will probably be undertaken by fall at Texola, Okla.

Proposed improvements to the water system at Ardmore, Okla., include steam and motor-driven pumping units of moderate capacity.

The installation of modern high duty pumping machinery of large capacity is under consideration at Pittsburg, Kan., where the present water works system is proving inadequate to the service imposed upon it.

The Southwest Universal Pump Company, Kansas City, Mo., will establish a manufacturing plant in leased quarters. The company's offices are now in the Postal Building, Kansas City.

The Waco Gas Company, Waco, Texas, has awarded the contract for a new steel plate gas holder, and it is reported that the equipment of its power plant will also be increased.

The Prest Machine Works Company, Oklahoma City, Okla., are doing a great deal of custom work at this season of the year for Southwestern mills, including steel roll grinding and corrugating.

Among the different manufacturing enterprises which are negotiating with the North Fort Smith Improvement Company, Fort Smith, Ark., for factory sites is an automobile company which will be capitalized for $200,000 and a furniture factory now located in Fort Smith, which it is stated has signed a contract for the removal of its plant to a site which will be deeded to it by the improvement company. Several other factories are also negotiating for sites, and it is expected that contracts will be signed within a short time.

The Greenfield Light & Power Company, Greenfield, Mo., has been incorporated with $10,000 capital stock by J. F. Johnson, Edwin Harrison and F. G. Van Osdell, and has purchased the electric light plant formerly owned by J. F. Johnson & Co. It will add a 75-kw. alternating current generator, and will also build a small ice plant, for which equipment is yet to be provided.

The Moon Motor Car Company, St. Louis, Mo., has completed plans and arrangements for a four-story factory building, which will have a total floor space of six acres. The plant will be of fireproof construction throughout.

Simons Brothers, Barnard, Kan., are enlarging their shop for the purpose of doing general automobile repair work and rebuilding traction engines.

W. C. Norris, who has established a machine shop at Tulsa, Okla., is in the market for a forging machine, some small power hammers and 20 to 24-in. engine lathes. Later he expects to purchase some small turret lathes. The shop building now being constructed will be completed within 30 days.

The South

CHATTANOOGA, TENN., June 27, 1910.

The machinery trade here has been quite lively, due to the diversity of manufacturing and jobbing interests represented, but reports from other parts of the South indicate that business is generally quiet. So far as bookings at the various foundries, boiler making plants, machine shops and other metal working establishments are concerned, orders for spares or repair parts seem to predominate. A good deal of tank work is being called for, and there have been a number of sizable contracts placed for elevated steel water reservoirs, while various other applications of sheet metal, including light building specialties, continue to bring a remunerative business to the concerns interested; but for machinery and accessory appliances, either mechanical or electrical, the demand is not urgent. What is known as "detail" apparatus sells much better than anything else.

Crushing machinery will be installed at Bowling Green, Ky., by the newly organized Kentucky & Tennessee Stone Company, in which R. C. P. Thomas of that place is interested. It will utilize the waste from the quarries of the Bowling Green White Stone Company, having been formed largely for that purpose.

It is reported, on what appears to be good authority, that the Woodward Iron Company, Birmingham, Ala., is about to proceed with the erection of by-product coke ovens at Woodward, Ala.

Among future large buyers of mechanical equipment and supplies in this section as operating needs dictate is the firm of Moffett, Bowman & Rush, who have just completed a new band mill in New South Memphis, Tenn.

An engine driven generating set for city lighting will be installed this coming fall at Aliceville, Ala.

The Harris Granite Company, Salisbury, N. C., which was recently organized to take over and operate a number of quarry properties in that vicinity, will improve and strengthen the equipment of the various plants.

The construction of an electric power plant for municipal service is under consideration at Barnwell, S. C.

Bids will be taken until July 11 at Charleston, S. C., on motor driven centrifugal pumps for the sewage station there.

The authorities have arranged to install a new Corliss engine in the municipal power plant at Thomasville, Ga.

The Roanoke Bridge Company, Roanoke, Va., has been awarded the contract for a steel highway bridge to be built at Madison, Ga.

The Diamond Gas Company, recently organized by Allen S. Eason, Huntingdon, Tenn., has let the contract for a plant, 40 x 80 ft., which will be equipped for the manufacture of small gas generating plants and other metal work. Offices have been established at 302 Church street, Nashville, Tenn.

A steam turbine of 2000 hp., condenser, alternating current generator and 500-kw. motor generator set have been purchased for the municipal plant at Jacksonville, Fla., the requirements of which were mentioned in this report some weeks ago.

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Pumping machinery for municipal water works will be installed some time this year at Lonsdale, Knoxville, Tenn.

The Blacklock Foundry, South Pittsburgh, Tenn., will erect two new buildings, 125 x 100 and 75 x 100 ft., the plans for which have not yet been fully determined upon.

Advices from Atlanta, Ga., are to the effect that the Atlanta Foundry & Machine Works will erect a new building, the purpose of which is not stated.

There will be some extension during the season of the operations of the North Carolina Granite Corporation, Mt. Airy, N. C., with probable need by fall of some additional equipment. On whatever new machinery is installed motor drive will be used.

The Hamrick Mills, Gaffney, S. C., are arranging for the installation of about 30 alternating current motors, together with three 175-kw. transformers to take electric power from a transmission line and convert it to operating voltage. Various auxiliary apparatus, including a switchboard with automatic control and registering devices will also be provided.

The McKinney Traction Cultivator Company, Atlanta, Ga., has been organized to establish a plant for the manufacture of agricultural machinery. W. J. McKinney is president and N. C. White secretary.

The Atlanta Sash Weight & Machine Works, 893 East Fair street, Atlanta, Ga., will erect a new factory which will have a capacity of 20 tons of sash weights a day.

The Golden Belt Mfg. Company, Durham, N. C., has let contract for a $30,000 addition to its mill. The present machinery requirements have been filled, but some further equipment will be needed later.

The Southern Packing Mfg. Company has been organized at New Orleans, La., and has established a plant for the manufacture of fibrous packings, rubber and asbestos gaskets, &c. It also took over the roofing jobbing business of P. F. Strieman. Its factory and offices are located at 801 Baronne street. C. T. Sondley is president; P. F. Strieman, vice-president, and D. B. Rogan, secretary-treasurer.

The Diamond Gas Engine Company has been incorporated at Nashville, Tenn., for the purpose of manufacturing the Diamond gas apparatus, which makes gas from gasoline by the cold process. Its factory will be equipped for doing both machine and sheet metal work, and in addition will be arranged for doing all kinds of experimental work in iron and sheet metal.

The Piedmont Mfg. Company, Shelby, N. C., has rebuilt the burned plant of the Shelby Machine & Supply Company and will do general repair work of woodworking machinery. The present requirements for tools have been filled. J. D. Lineberger is president.

The Dowling Engine Works has been organized at Biloxi, Miss., with $100,000 capital stock, to manufacture a headless twin cylinder engine. Plans for its proposed plant will be completed in a short time. E. J. Dowling is the principal member of the firm.

The Dalton Foundry & Machinery Company and the Southern Iron & Equipment Company, Atlanta, Ga., have recently added to their equipment, installing Newton cupolas.

The Northwest

ST. PAUL, MINN., June 27, 1910.

There is not as much snap to the market as formerly. A scattered business in equipment for power and heating plants, shop machinery, factory appliances and construction rigs has been done at various centers of distribution, particularly in the Twin Cities, but the past week has witnessed a general slowing down of trade, notwithstanding the fact that there is an abundance of business in sight. Just at present the owners of industrial establishments, as well as dealers and traveling salesmen, seem to be thinking more about fishing trips and vacation sojourns on the numerous small lakes of this North country than of orders for machinery and supplies. Hence, the business now being attended to is mainly of a routine character. The conditions noted will probably hold all through the remainder of the summer, except for spurts of buying caused by the fruition of plans that have heretofore been pending for new plants, factory additions, power stations and the like.

The Gas Traction Foundry Company, Minneapolis, Minn., has awarded contracts for an addition to its present plant, 72 x 117 ft., and a new foundry building, 80 x 132 ft.

It is reported, from what appears to be an authentic source, that pumping machinery will be installed at Billings, Mont., by the Northern Pacific Railway, to draw water from the Yellowstone River for roundhouse and other service.

A Corliss engine and electric generator will be added to the power plant equipment of the Spring Valley Electric Light & Investment Company, Spring Valley, Minn.

The State Capitol Commission, Pierre, S. D., will receive bids until July 22 on a receiving tank and 80-hp. gas engine to operate on natural gas and drive an electric dynamo.

Work is about to commence on a new plant for the Western Portland Cement Company, Yankton, S. D., which will be electrically operated.

An addition will be built to the planing mill of the Enterprise Lumber Company at Kalispell, Mont., and some new machinery installed.

The Kettle River Company, Minneapolis, Minn., is following a definite line of expansion at its quarries in Sandstone, Minn., which will call for heavy future purchases of operating equipment. There is none, however, to be made just at this time.

The American Hoist & Derrick Company, St. Paul, in consequence of the necessity for enlarged manufacturing facilities, as recently mentioned, will proceed with the erection of a new machine shop and assembling department.

The Builders' Iron Works Company, Minneapolis, Minn., will soon complete a new plant, the erection of which has been found necessary in order to take care of the company's rapidly growing business.

The installation of a mechanical filtration plant is proposed at Fargo, N. D.

The Eagles Nest Mining Company, Alhambra, Mont., which is reported to be owned by Robert A. Bell, Helena, will complete an ore milling plant. Among present requirements in the way of equipment is an air compressor.

The construction of a system of water works is under consideration at Townsend, Mont., and a decision in regard to the matter will be reached by the authorities early next month.

The Starr Motor Car Company, Minneapolis, Minn., has just completed negotiations with the Downing Commercial Club, Downing, Wis., whereby it will remove its factory to that city. A concrete factory building, 90 x 130 ft., will be erected on the site presented to the company by the city.

The Watertown Steel Tank & Metal Culvert Company, which is composed of Sioux City, Iowa, men, is erecting a new plant at Watertown, S. D., and not moving one from Sioux City, as was stated in *The Iron Age* June 16.

The North Pacific Coast

SEATTLE, WASH., June 24, 1910.

Trade in machinery and mechanical equipment of all kinds, including iron, steel and alloy metal castings for various purposes, continues fairly active. The shops are all busy with orders, bookings in most cases being sufficient to keep them in operation for some time ahead, and sales offices or agencies have a large number of negotiations pending. The buying at present is mostly of the hand to mouth character usual during the summer season, but its aggregate volume is quite satisfactory, and there are excellent prospects for the fall.

Peter Sandberg, Tacoma, Wash., has purchased a direct current generator of 75 kw. driven by an automatic, self-oiling engine, to furnish light and power for property in which he is interested.

The installation of municipal water works has been decided upon at Joseph, Ore., and funds provided.

The capital stock of the Star Machinery Company, Seattle, has been increased to $100,000 to meet the growing needs of the business.

An electric generating unit of 75 to 100 kw. capacity will be installed by the Eckart Pumping & Heating Company, Seattle, on a plant for which it has the contract at Monroe, Wash.

The Armstrong Mfg. Company, Portland, Ore., is preparing for an increased output next season of its improved swage and shaper, which have been in excellent demand.

A small direct current generator will be installed shortly by the Pacific Creosoting Company, Eagle Harbor (Creosote), Wash.

One of the largest contracts in its line of business taken in this part of the country for some time past has been awarded the A. F. Cizek Sheet Metal Works Company, Tacoma, for work on the new railroad station there.

The Eugene Heating & Electric Power Company, Eugene, Ore., is about to proceed with the erection of a power plant building.

Among the industries now established at Raymond, Wash., as prominently brought out in the recent meeting there of the Southwestern Washington Development Asso-

THE MACHINERY MARKETS

ciation, are the Raymond Foundry & Machine Company, Mykal & Loveless Machine Company, Raymond Mfg. Company and S. B. Raymond Electric Company, besides a large number of sawmills, woodworking and other plants. The occasion of the meeting was to celebrate the opening of two new steel bridges over the forks of the Willapa River, connecting the island on which Raymond is situated with the mainland on either side.

The Raymond Foundry & Machine Company, Raymond, Wash., is building an addition to its works, and will extend its line of manufacturing. Among future products will be grate bars of a new design for use in the furnaces of steam power plants.

Two new gyratory breakers for crushing heavy rock will be put in service this season by the contracting firm of Wright & Sweeney, Tacoma, Wash. The machinery has been ordered from the East.

The Beach Mfg. Company has been organized at Portland, Ore., by interests identified with the company of the same name at Charlotte, Mich., to establish a fabricating plant. In addition to bridge and culvert work, road making and grading machinery will be manufactured.

The Columbia Steel Company, Portland, Ore., is completing installation of the machinery in its new plant at Linnton, Ore.

The Sumner Iron Works, Everett, Wash., will furnish the operating machinery for the new Schwager & Nettleton Mills, Seattle, whose purchases of power house equipment, including steam turbine, generator and alternating current motors, have been previously referred to.

For the municipal incineration plant at Vancouver, B. C., there will be required two water tube boilers, four blowers driven by automatic steam engines, and other mechanical equipment. The Public Works Engineering Company, whose office is in the Beck Building, Portland, Ore., has the complete contract and will purchase all material needed.

The engineering department of the Mount Hood Railway & Power Company, with headquarters in the Sweetland Building, Portland, Ore., has started work on the electric generating station at Ball Rock, which will furnish power for the traction line to be built this summer. The equipment of the station has not yet been bought.

The Farther Central West

OMAHA, NEB., June 27, 1910.

The machinery dealers in this territory and direct representatives of outside manufacturers are having a varied experience. Some of those from whom reports have been obtained state that trade is holding up very well, as compared with the opening weeks of the month, while others find that it is falling off. June has, however, established an excellent record for continuously favorable business, and the number of live negotiations that are being carried over into July will undoubtedly give that month a good start, as the majority of those now pending will be closed in the near future. Local industries are in a flourishing condition, with bookings in most cases sufficient to carry them along for months with little or no new business; and, as the latter continues to be offered in fair measure, the natural result is planning of extensions, which still goes merrily on. In relation to machinery ordered from the East through dealers in the larger centers of distribution, it is now quite difficult to get satisfactory terms of delivery on many classes of tools and other apparatus. This is inducing some of the metal working shops to order ahead, while others are waiting, as usual, until their need is more urgent.

The Grupe Drier & Boiler Company, Davenport, Iowa, is about to erect a one-story building.

Extensive additions are being made to the equipment of the Pueblo & Suburban Traction Company's steam turbine power station at Pueblo, Colo., principally in the line of apparatus auxiliary to the generating units.

A direct current generator, switchboard, &c., for lighting service will be included in the machinery to be installed by the Maney Milling Company, Omaha, in the plant which it is now building.

Bids will be taken until July 1 on the constructions and equipment of the electric power and pumping station and a complete system of water works at Milford, Neb.

The Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, is installing three 500-hp. boilers manufactured by the Edge Moor Iron Company, Edge Moor, Del., in addition to one already in service, besides older equipment. A steam turbine unit of 1500 kw. was added to the company's electric generating facilities last winter and another may be installed during the coming fall.

An air compressor is to be installed in the near future by the Accord Mining & Milling Company, Georgetown, Colo., according to a report received from that place.

The Blaine & Emmet Mining Company, Ltd., Murray, Idaho, will install a complete compressor outfit, with drills, &c.

As the result of a change in ownership, the pumping plant and water works system at Oskaloosa, Iowa, which are privately operated, will be improved. Some additional equipment may be installed.

The Wyoming Coal Company, which is building a new coal breaker at Monarch, Wyo., has decided to operate it with electric motors. An order has been placed with Eastern manufacturers for five squirrel cage induction motors to operate the breaker and two 150-hp. wound rotor induction motors for use on the haulage system.

Shops for repair work will be completed this year in Goldfield, Nev., by the Tonopah & Goldfield Railroad Company, which is about to establish its headquarters there.

An electric power and pumping plant for municipal service will be completed this year at Lemon, Colo. Plans and specifications have been ordered prepared.

The water works system proposed for Murray, Utah, will include, besides pumping machinery, an elevated steel water reservoir.

The Anamosa-Oxford Junction Light & Railway Company, Anamosa, Iowa, will install a new Corliss engine, generator, transformers, &c.

The Warm Springs Iron Works, Salt Lake City, in addition to the sale of an extensive line of mining and ore reduction machinery, is doing a large business in repair work for the companies operating in this territory, the execution of rush orders being a specialty. A considerable enlargement of the plant within the coming year is looked for locally.

The Salt Lake City representatives of Fairbanks, Morse & Co. have sold three heavy Nissen stamps to be installed at the plant of the Hayseed Mining Company, Lee, Nev.

Work will begun shortly on a pumping plant and water works system for Kingsley, Iowa, the construction of which has just been authorized. Equipment will be purchased about August 1.

The Niobrara Investment Company, Omaha, Neb., has been incorporated with a capitalization of $1,200,000 and will locate a power plant at the mouth of the Niobrara River. Lysle I. Abbott and Arnold C. Koenig of Omaha are interested in the enterprise.

Government Purchases

WASHINGTON, D. C., June 27, 1910.

The Paymaster General, Navy Department, Washington, will open bids July 5 for the following: Schedule 2630, eight 12-hp. automatic oil engines; 2637, 30 steam traps, and on July 12, under schedule 2615, six trolley hoists; 2632, one combination rip and cut-off saw, one universal woodworker, one band saw and one wood turning lathe.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids July 12, under schedule 2661, for one motor generator, and on July 19, schedule 2650, for one cutting-off machine.

Bids were recently opened by the engineer of the Third Lighthouse District, Tompkinsville, N. Y., for furnishing and delivering one universal cutter grinder and one turret lathe, as follows: J. P. Kemp, Baltimore, Md., grinder, $387; Pratt & Whitney Company, New York, grinder, $445; lathe, $1685.60.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids June 21 for the following:

Class 41.—One heavy planing machine—Bidder 54, Fairbanks Company, Washington, D. C., $2637; 70, Garvin Machine Company, New York, $2636; 102, Manning, Maxwell & Moore, New York, $3630 and $2425; 120, Niles-Bement-Pond Company, New York, $3365, $3140 and $2620; 129, Prentiss Tool & Supply Company, New York, $3015 and $2886; 151, William Sellers & Co., Philadelphia, Pa., $4525.

Class 51.—One vertical duplex pump—Bidder 16, Baker, Knowles Steam Pump Works, New York, $615; 42, M. T. Davidson & Co., Brooklyn, $375; 177, Warren Steam Pump Company, New York, $478 and $464.

Class 103.—Two direct current motors and three controlling panels—Bidder 43, Diehl Mfg. Company, Elizabethport, N. J., $509; 58, Fort Wayne Electric Works, Fort Wayne, Ind., $462; 66, General Electric Company, Schenectady, N. Y., $581; 145, Sprague Electric Company, New York, $495; 152, B. F. Sturtevant Company, Hyde Park, Mass., $726.76; 170, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., $689.

Class 171.—Involute gear circular pitch cutters—Bidder 68, R. W. Geldart, New York, $1201; 102, Manning, Maxwell & Moore, New York, $1254.90; 114, Montgomery & Co., New York, $1254.90 and $1131.40; 149, R. B. Sherman, New York, $1127.50.

The supervising architect, Washington, opened bids June 20 for one high pressure steam water tube boiler for the Post Office at Baltimore, Md., as follows: The Flannery Griffiths Company, Baltimore, $5900; Crook, Kries & Co., Baltimore, $6245; E. Keeler Company, Williamsport, Pa., $8082; John B. Adt, Baltimore, $7046.

Personal

J. B. McClary, formerly general manager of the Sheffield Company at Sheffield, Ala., has been elected vice-president and general manager of the Yolande Coal & Coke Company and the New Connellsville Coal & Coke Company and president of the Abernant Coal Company, with headquarters in the Brown-Marx Building, Birmingham, Ala.

C. C. Ramsey, who was made first vice-president of the Crucible Steel Company of America a short time ago, has now been elected president. It was understood that Herbert Du Puy, chairman of the board, who was made president after the death of Frank B. Smith, accepted the latter office only for the time being. Mr. Ramsey has been in charge of the sales department of the company in New York since 1900, being for a time third vice-president and later assistant to the president. He was appointed in May to succeed Reuben Miller as first vice-president.

James M. Wakeman, who recently resigned the position of first vice-president of the McGraw Publishing Company, New York, was tendered a luncheon June 21 by his friends in the engineering and machinery fields. He sails for England in July to take a long rest ordered by his physician. His successor is Hugh M. Wilson.

Hollinshead W. Taylor of the N. & G. Taylor Company, Philadelphia, sailed June 21 from New York to spend the summer touring through Norway, Germany, and the Austrian Tyrol.

W. E. Crist, formerly president and general manager of the Crist Valve Mfg. Company, is now the general manager of the valve department of the O. M. Edwards Company, Syracuse, N. Y.

J. H. Fox of Frazier & Fox, engineers, Cleveland, Ohio, has accepted an appointment as chief engineer of the Pittsburgh Plate Glass Company, Pittsburgh, Pa., and will assume his new duties July 1. The appointment necessitates the dissolution of the partnership. J. W. Frazier will continue his business in the offices occupied by the partnership concern in the Rockefeller Building, Cleveland.

J. R. Rerick, formerly of the *Sun*, Kendallville, Ind., has been made manager of the Chicago office of the Challenge Machinery Company.

E. H. Gary, chairman of the United States Steel Corporation, sailed on the Lusitania June 29 for a European trip, lasting until early September.

W. E. Corey, president of the United States Steel Corporation, is expected to return from Europe July 7.

N. J. Higinbotham of the Wheeling Steel & Iron Company, Wheeling, W. Va., on July 1, takes the position of Eastern manager of sales, with headquarters in the Hudson Terminal Building, New York City, succeeding C. S. Stephens, resigned.

E. W. Edwards, president and general manager of the Edwards Mfg. Company, Cincinnati, Ohio, arrived home last week after a tour of over five months, during which time he visited many countries in Asia, Africa and Europe. A banquet was given to him June 23 by the heads of departments and the office force of the company.

G. P. Blackiston, Pittsburgh, succeeds the late W. W. Wallace, in charge of the advertising department of the Berger Mfg. Company, Canton, Ohio.

Effective July 1, Charles J. Colvert, Jr., recently connected with the Consolidated Connellsville Coke Company, Uniontown, Pa., will be associated with the Washington Coal & Coke Company in the sales department, Conestoga Building, Pittsburgh, Pa., to succeed T. M. Hyndman, resigned.

D. K. Nicholson of Nicholson & Co., operating the Pittsburgh Chain Works, Rankin, Pa., sailed for Europe with his family on June 25, and will be absent several months.

C. T. Anderson has been appointed manager of the Chicago office, 1616 Fisher Building, of the C. W. Hunt Company, New York.

Interesting Tool Demonstrations

The Fairbanks Company demonstrated during the week June 20-25, at Seventh and Arch streets, Philadelphia, Pa., a Prentice Brothers 20 in. x 10 ft. high speed, geared-head lathe, a Flather 24 x 24 in. x 6 ft. rapid action two speed drive planer, and a Flather high duty shaper. There tools were operated on practical jobs by experienced machinists, working under varying conditions. Considerable interest was shown in the demonstration, which was visited by a large number of representatives of users of such tools.

On Saturday afternoon special tests were made on both the lathe and planer in the presence of a number of representatives from various concerns. The lathe, operating on a piece of 0.25 per cent. carbon steel 5 in. in diameter and 2 ft. long, showed by cut meter test, making a 5/8 in. rough cut, 1/8 in. feed, to be cutting at the rate of 120 ft. per minute, taking the full power of a 25-hp. Fairbanks tandem gas engine, operated to its limit. A finishing cut was made at the rate of 350 rev. per min. The Flather planer, on high speed, cutting at a speed of 65 ft. per minute, and a return of 180 ft. per minute, took a 5-16 in. cut on a 3-16 in. feed. On slow speed, running 40 ft. per minute, with a return of 180 ft. per minute, a 5/8 in. cut on 1/8 in. feed was taken. This was operating on close grain cast iron. The shaper demonstration, on a 16 in. machine, was made with the driving shaft running at 325 rev. per min. The perfect control of the tool, showing the change in the amount and position of the stroke, as well as 10 different speed changes while in full operation, was shown.

So successful has the proposition of practical demonstrations of these tools been, that the Fairbanks Company has decided to continue them from time to time, showing the possibilities under actual service of the various tools sold.

The Garwood Electric Company, Garwood, N. J., has appointed the Varney Electrical Supply Company, 235 South Meridian street, Indianapolis, its agent in the territory covering that portion of Indiana south of a line drawn east and west through Fort Wayne, except Bedford and within a radius of 10 miles of Bedford; that portion of Kentucky bounded on the east by a line drawn north and south through Frankfort and including Frankfort, and on the west by a line drawn north and south through Henderson and including Henderson. It has also appointed the Electrical Manufacturers' Sales Company, Denver, Colo., as its agent in the territory covered by Colorado, Wyoming, Utah, New Mexico and eastern half of Idaho.

The stockholders of the new corporation to be formed by the merging of the Dominion Iron & Steel Company and the Dominion Coal Company held an adjourned meeting in Montreal June 23, at which it was formally decided to adopt as the name of the consolidated company the Dominion Steel Corporation, Ltd. The stockholders had previously decided upon the Canadian Steel Corporation, but after the Hamilton merger had selected as its name the Steel Company of Canada it was decided that these names would be altogether too similar.

Features of a Large Plant for Tool Manufacture

The St. Louis Works of Fayette R. Plumb, Inc.

The purchase of a tract of 13 acres outside the western limits of St. Louis for the erection of a large plant for Fayette R. Plumb, Inc., of Philadelphia, has already been noted. St. Louis was chosen because of its advantages as a distributing center, more tools being distributed by the hardware jobbing trade within a radius of 300 miles of St. Louis, it is said, than from any other territory of equal size. The new plant will be composed of 16 buildings, 13 of them being devoted directly to manufacturing purposes, and the other three being an office building and chemical laboratory, a service building and a power house and machine shop.

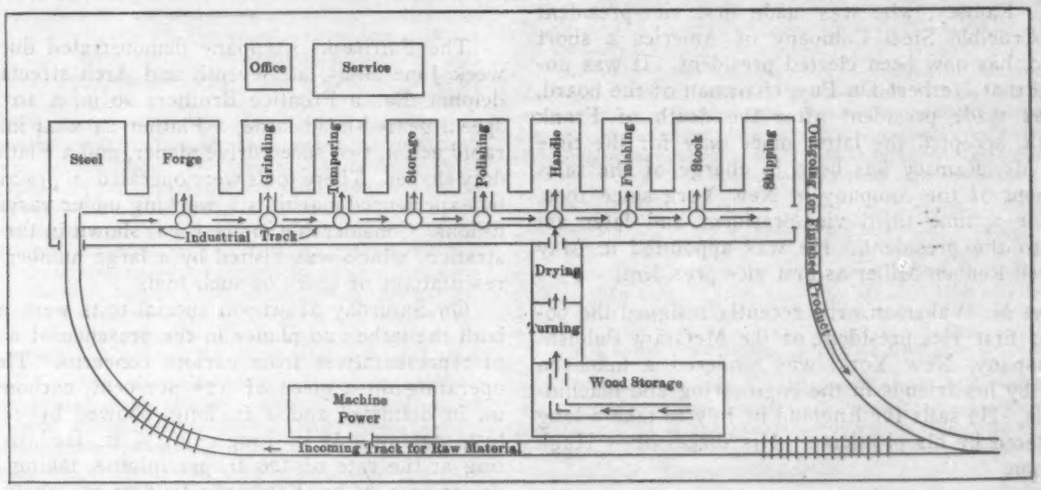


Fig. 1.—Plan of the New St. Louis Works of Fayette R. Plumb, Inc.

The raw material will be brought to the plant on a special track running into the steel storage building, two stories, built of reinforced concrete with brick walls. The steel is here unloaded from the cars by cranes. It is then worked through the forge shop, grinding and tempering departments, and then into an intermediate stockroom, from which the different kinds of tools are drawn as required on orders. The tools are then polished and go to the handle room. Joined to the handle room is a wing composed of three buildings, separated from each other by fire walls. In these the wood is stored and made into handles. At this point in the manufacturing process the wood meets the steel, and the two are assembled. A fire wall separates the polishing department from the handle department, and the finishing building from the stockroom. After the tools are handled they go to the finishing department, then to the stockroom, where they are labeled, then to the shipping department where they are packed, boxed and loaded.

The office and service buildings, power house and machine shop are in close proximity to all other buildings. The service building will be set aside for the exclusive use of employees. It will be provided with steel lockers, benches and necessary toilet facilities, so that workmen can change their clothes and prepare for work before going into their various departments. This building will save considerable space in the manufacturing departments ordinarily used for lockers and washrooms. Part of the office building will be used for a chemical laboratory, the methods of the company taking into consideration the chemical composition of steel and the proper heat treatment.

The buildings vary in design, according to the branch of the industry for which each is to be used. All walls are of brick; the roofs are of steel, roof trusses being covered either with concrete or slow burning material. The buildings have been so cleverly designed that a leading fire insurance company has quoted a rate of 5 cents per $100.

The windows are placed high, near the ceilings, in order to obtain full advantage of natural light. They are in tiers and are pivoted vertically so that they can be opened in both summer and winter to allow smoke to blow out without subjecting workmen to drafts. The shape of the buildings also adds to the lighting. Between the department buildings is a passageway in which will be located inspectors.

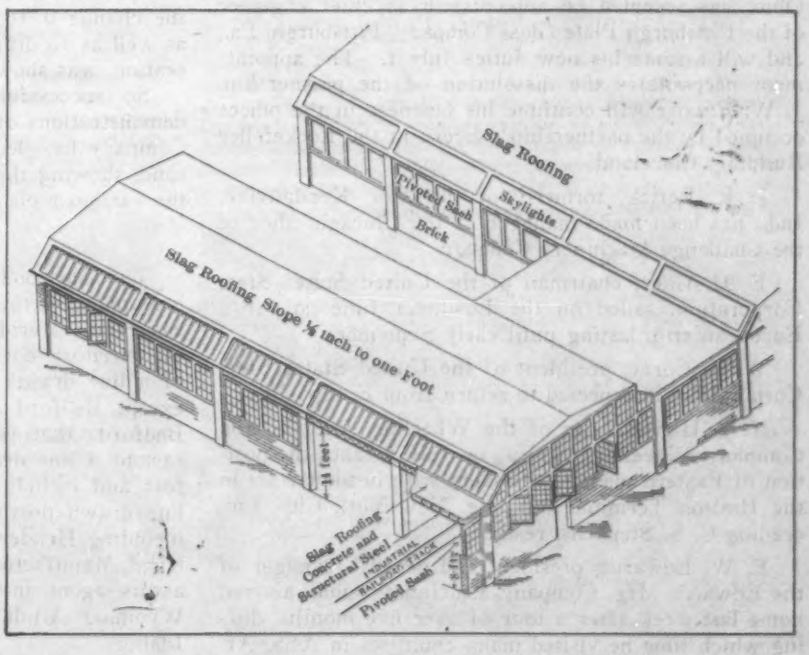


Fig. 2.—Typical Front Elevation of One Building.

The plant will contain about 78,000 ft. of floor space, will employ about 400 men, and will be one-half the size of the ultimate plant, but a much greater increase in capacity can be made, due to the design, without any rearrangement of the original plant.

John G. Brown, Philadelphia, is the designer and builder of the plant.

Trade Publications

Foundry Equipment.—The J. D. Smith Foundry Supply Company, Cleveland, Ohio. Pamphlet. Refers to the installation of a large battery of rolling drawer core ovens recently made for the Ferro Machine & Foundry Company, Cleveland, Ohio. An illustrated description of this installation was printed in *The Iron Age* April 21, 1910.

Gas and Gasoline Engines.—Abenaque Machine Works, Westminster Station, Vt. Catalogue. Calls attention to the various styles of engines, saw frames and direct connected outfits manufactured by this company and also the more important farm machines handled by them. The descriptions of the machines are brief of necessity and are supplemented by illustrations. Separate catalogues giving more detailed descriptions of the machines are also issued.

Chucks.—Union Mfg. Company, New Britain, Conn. Catalogue. Shows a large and varied line of universal, independent, combination and geared scroll chucks. In addition to the ordinary styles of chucks, space is given to face plate jaws, carwheel chucks with five, six and eight jaws, milling and grinding machine chucks, two-jaw box body chucks, a patent valve chuck with ball bearings, and planer and twist drill chucks. All of these types are described and illustrated.

Drills.—The Morse Twist Drill & Machine Company, New Bedford, Mass. Catalogue. Size 4¾ x 7 in.; 336 pages. Concerned with a line of drills, reamers, chucks, milling cutters, taps, dies and machinists' tools. All the different tools are illustrated and the list of the different sizes together with the principal dimensions is appended. There is also a 38-page appendix giving general information on a number of subjects of interest to machinists.

Electric Coal Puncher.—The Pneumelectric Machine Company, Syracuse, N. Y. Booklet. Devoted to a coal punching machine which is a combination of the features of the pneumatic and electric machines now on the market. Air expanding under pressure produces the blow and the air utilized in striking it is compressed at each stroke by a piston driven by an electric motor which forms a part of the machine and is operated from any of the circuits ordinarily found in mines and industrial plants. The machine is illustrated in operation and there are a number of views showing details of its construction.

Traveling Electric Hoists.—Pawling & Harnischfeger Company, Milwaukee, Wis. Bulletin No. 18, superseding No. 16. Calls attention to the wide variety of traveling electric hoists manufactured by the company. These are designed for various classes of service and range from a small one-motor hoist designed for operation by pendant cords from the floor where the travel is secured by pushing on the load, to large two-motor hoists for use on overhead I-beam tracks and transfer bridges. Illustrations show these hoists in actual service in a number of plants for handling a great variety of materials.

Automatic Screw Machines.—The Davis Sewing Machine Company, Dayton, Ohio. Booklet. Illustrates and describes the operation of the Lester multiple spindle automatic screw machine, which is designed for the production of all classes of work, both simple and complicated, turned from the bar. Three spindles are used in this machine, but nine tool positions are provided so that the machine can take care of pieces requiring a variety of cuts.

Power Trucks.—R. L. Morgan Company, Worcester, Mass. Mailing card. Devoted to the Morgan power trucks for transporting material from factories and shops to customers and depots quickly, economically and in maximum quantities per load. Among the advantages claimed for these trucks are interchangeability of parts, centrally located engine with less parts than any other, and one that is accessible on all sides. The engine, transmission gear and the jackshaft are all independent units which can be removed in a few minutes. The control of this truck is said to be more simple than that of an electric vehicle. The maker is prepared to furnish any one of a large number of standard bodies.

Marine Gas Engines.—Progressive Mfg. Company, Torrington, Conn. Brochure. Gives general description and specifications for a line of marine gas and gasoline engines ranging from 1½ to 25 hp. These engines are built with from 1 to 4 cylinders, according to the horsepower developed, and are fitted with either the make-and-break or jump-spark ignition. In addition to the marine engines, this company also manufactures a 4-hp. stationary engine furnished with the make-and-break ignition system. The illustrations include the different models of the engine and also the various parts entering into their construction. Tables give the dimensions of the various sizes.

Nut and Bolt Fasteners.—United Nut Lock Company, Springfield, Mass. Catalogue and price-list. Deals with the Hugtite nut and bolt fasteners for steam and street railway equipment of all classes, motor-driven vehicles and electrical, harvesting, mining and general machinery. This nut lock or washer is made with tongues projecting into the center in such a manner as to engage the thread of the bolt, and is designed to be locked over the nut where the bolt projects one or more full threads beyond the nut. These fasteners are made for all diameters of bolts from ¼ to 1½ in.

Water Meters.—Buffalo Meter Company, 290 Terrace, Buffalo, N. Y. Pamphlet. Concerned with the American and new Niagara water meters and their accessories. These meters are of the disk type and are said to be positive in action, naiseless in operation, of very few parts and adjustable for excessive pressures. They are described at some length with reference to illustrations of the various parts. Seven sizes ranging from ⅝ x ½ in. to 2 in. are manufactured. Instructions for reading the dials and setting the meters are given, and various accessories such as dial extensions, an iron meter lock box, manhole rings and covers, and extension dial curb boxes are shown and described.

Piping and Exhaust Head.—Abendroth & Stein, Inc., 39 Cortlandt street, New York City. Price-list. Pertains to a line of straight riveted flange pipe, smoke stacks, flues, blow-off tanks, strainers, pumps and pump fittings and ventilators. Space is also given to a patent exhaust head which is made in sizes ranging from 1½ to 30 in. diameter of exhaust pipes. The advantages claimed for this head are simplicity of construction, freedom of egress for the steam and special provision for thoroughly separating the water of condensation from the exhaust steam. A partial list of users of this head is appended, which includes power plants, electric light stations, factories, mills and office buildings in all parts of the country.

Grinding Machines.—The Heald Machine Company, Worcester, Mass. Catalogue. Size 6 x 9 in.; 96 pages. This is the company's 1910 catalogue describing and illustrating a line of grinding machines which include internal, cylinder, ring and drill grinders. It is divided into four sections, each of which supersedes the separate catalogues formerly issued. The different machines of each line are illustrated and described. *The Iron Age*, April 2, 1908, printed an illustrated description of the internal grinder manufactured by this firm.

Hydraulic Vacuum Pumps.—The Bishop & Babcock Company, 525 Garfield Building, Cleveland, Ohio. Booklet, entitled "Vacuum Heating." Concerned with the Reliable automatic hydraulic vacuum pump which is designed for use in connection with any vacuum system of steam heating to improve the circulation and regulation and the fuel economy. This pump is said to produce a positive vacuum. Heretofore the maintenance of a vacuum was dependent upon either automatic vacuum valves alone or rejector systems, both of which, it is said, did not give good results. With this pump, air binding and water hammer are done away with and a fuel reduction of from 25 to 40 per cent. is claimed. It is not necessary to give the pump any attention, as an automatic cut-off valve which acts as a regulator or governor is adjustable to any desired vacuum from 5 to 25 in., and will cut in or out on a variation of 1 in. This system is adaptable to any building regardless of its size, and a number of typical installations are illustrated and two suggested installation schemes are included.

Engine Lathes.—South Bend Machine Tool Company, South Bend, Ind. Catalogue No. 40. Gives general description and specifications of the South Bend engine screw-cutting lathes, which are built in a number of different sizes. The smallest is a bench lathe having an 8-in. swing and is intended to be used for manufacturing or for the toolroom, where small and accurate work is desired, and the largest is an 18-in. model built with four sizes of bed, the longest of which is 10 ft. All of these lathes with the exception of one 9-in. model are driven from countershafts by a belt connection. These models are all illustrated and brief specifications are given on the facing pages. Space is also given to the special type of reverse used on the larger sizes, three types of turrets, tools and the various parts, such as centers, rests, dogs, drill chucks, independent jaw chucks, scroll chucks and drills.

Valves and Steam Specialties.—The Ohio Brass Company, Mansfield, Ohio. Catalogue H. Describes and illustrates a full line of steam and hot water radiator valves, with and without unions, angle, globe and check valves, and lock and shield valves. Space is also given to bronze fittings, gauge cocks, water gauges, ball bearing glands and pressure regulating valves. The different valves and specialties are illustrated and described and sectional views are included to show the operation.

Thread Milling Machines.—Bickford & Washburn, Inc., Greenfield, Mass. Catalogue No. 1. Calls attention to the pipe tap thread milling machine, for threading and relieving the threads of any tap having a thread not over 3½ in. long nor coarser than 6 pitch. This machine, while designed for threading pipe taps, may be used to advantage on all taps where it is desired to relieve the threads, and will thread both right and left hand taps. The machine is also arranged to thread its own cutters and can be used to advantage in making other formed milling cutters, doing the work of a relieving lathe in this respect. Space is also given to multiple index milling centers and solid and open dies for tap threading. Illustrated descriptions of these tools, with the exception of the solid die, were

printed in *The Iron Age* October 7, 1909, and January 27 and June 16, 1910, respectively.

Bolts, Nuts and Rivets.—The Rivet, Bolt & Nut Company, Ltd., 74 York street, Glasgow, Scotland. Catalogue. Treats of a large and varied line of bolts, nuts, rivets and bars which this company manufactures in a large number of lengths and diameters. These are all illustrated and a list of prices is appended. In addition the catalogue contains weights of square iron and steel bars, particulars of rivet tests, hints on heating rivets and other useful information.

Motor Trucks.—Rapid Motor Vehicle Company, Pontiac, Mich. Brochure entitled "A Book of Wonderful Tales." Relates to the use of Rapid motor trucks for handling a wide variety of goods. Each different line handled is made the subject of a tale in which the principal points of interest to motor truck users are given and on the facing page is an illustration of the truck at work. Among the different uses described are hauling magazines from a publishing house to the post office and railroad stations, collecting butter and eggs, hauling manufactured steel between the mills and the freight yards, and the various other kinds of general delivery service.

Foundry Blowers.—American Blower Company, Detroit, Mich. Bulletin No. 286. Deals with the use of ABC and Sirocco blowers in foundries, where they are employed for furnishing heat in winter, providing for cooling during the summer, and supplying pure air throughout the entire year. They are also used to supply the draft for the boiler, cupola, furnace and forge, and in connection with exhaust elevating and conveying systems. A number of representative installations are illustrated which show the great variety of applications of which this apparatus is capable. A number of the blowers used for this class of work are also shown.

Transmission, Conveying and Elevating Machinery.—Webster Mfg. Company, 2410 West Fifteenth street, Chicago, Ill. Catalogue No. 35. Size 6½ x 9¼ in.; pages 632. Bound in cloth. Refers to the full line of machinery and equipment which the company is prepared to furnish for use in power plants, grain elevators, mills, cement plants, coaling stations, smelters, sugar refineries, sand and gravel pits, stone crushing and gypsum plants, and lime works. This includes elevating and conveying machinery designed for heavy duty in connection with handling materials such as ore, stone, coal and cement, power transmission machinery, including rope, shafting and accessories, belting, clutches, gears and gas and gasoline engines, and coal and ash handling machinery. Practically all these different pieces of apparatus are illustrated and there are a number of plants shown in which this machinery has been installed. Complete tables of dimensions are given to assist architects and engineers specifying the apparatus in making up details, and a complete alphabetical index is appended.

Leather Belting.—The Graton & Knight Mfg. Company, Worcester, Mass. Circular. Treats of the various leather products marketed by this firm under the G. & K. trademark, which includes leather belting, lace leather, leather packings, belt dressings and cement.

Rail Joint.—W. L. Buckland, Utica, N. Y. Pamphlet. Relates to the Buckland patented rail joint and safety clamp, in which the two ends of the rails are locked together in such a manner that there is no downward spring and yet at the same time each rail can be instantly withdrawn if desired. The advantage of this joint is that with it no fish-plates are required, as the joint is made by slipping three 1¼-in. bolts in place. The safety clamp is intended to prevent accidents due to the rail spreading and consists of a clamp fitting around the base of each rail and connected together by a round rod.

Steam Turbines and Electrical Machinery and Appliances.—General Electric Company, Schenectady, N. Y. Four bulletins. No. 4732 illustrates over 50 installations of Curtis steam turbine generators of various capacities in electric light and power plants throughout the United States. No. 4737 illustrates and describes an electric hardening furnace for the hardening or tempering of tool steel in which metallic salts are brought to a liquid state by passing electric currents through them, and the heating of the tools to be hardened can be controlled and kept uniform throughout a wide range of temperature. The bulletin contains sectional views of the furnace, diagrams of the connections, and a chart showing the power required to operate it. No. 4738 describes three sizes of polyphase 60-cycle belt-driven revolving-armature generators for use in small isolated plants. These range in capacities from 7½ to 25 kw. and are furnished to generate 120, 240, 480 and 600 volts. No. 4741 calls attention to the multiple luminous arc lamp which is especially adapted for lighting machine shops, foundries, factories, yards and places where the slight fumes given off by the lamp are in no way objectionable. The lamps may also be used for commercial service, and is said to be one of the most efficient lighting units ever produced.

Coal Chute.—H. M. Richardson Steel & Iron Company, Cincinnati, Ohio. Folder. Devoted to a line of foundation coal and wood chutes which are designed to be placed in the cellar wall the same as a window for depositing coal, wood or vegetables in the cellar. These chutes are provided with a hopper which can be removed when a wagon chute is used. One of the models fulfills the demand for a fuel chute and at the same time acts as a window also. Light is secured through a translucent, flexible, wear-resisting composition sheet which is protected by a steel shield when the door of the chute is opened.

Comptometer.—Felt & Tarrant Mfg. Compny, Pauline street and Wabansia avenue, Chicago, Ill. Booklet, entitled "Rapid Mechanical Calculation." Describes and illustrates the comptometer in general and an improved duplex machine known as the new noiseless model C. This will perform any operation involving addition, subtraction, multiplication or division in any line of business, quickly and accurately. In addition to the regular type machine which adds dollars and cents, other models are built which include a payroll machine which is provided with an additional column for adding the minutes in multiples of five and a fraction machine which has a column for adding fractions in eighths.

Foundry Equipment.—Calumet Engineering Works, Harvey, Ill. General catalogue No. 6. Size 9 x 12 in. pages 62. This is the company's 1910 catalogue, describing and illustrating in a general way the variety of work which it undertakes. This includes complete equipment for gray iron, malleable and brass foundries, and cranes and overhead trolley systems for railroad and car shops, machine shops, power houses and steel plants. Among the articles illustrated are cupolas, ladles, tumblers, industrial railroad equipment, elevators, core ovens, electric, pneumatic and hand power cranes for all purposes.

Air Brake Governor.—National Brake & Electric Company, Milwaukee, Wis. Bulletin No. 390. Embodies a general description of three types of air brake governors which this company has brought out for use in connection with electric car air brakes. Three styles of governors are illustrated and described, the type N, or oil-pneumatic governor; the type R, which is a diaphragm governor, and the type A, or valve-pneumatic governor. These governors are positive in action, very simple in design, durably constructed, and contain no complicated delicate mechanism to get out of order; if repairs are necessary they can be made by the average car barn man. Detailed descriptions of the three types are given, supplemented by illustrations of the exterior and line engravings showing the details of their construction.

Fan Blowers.—The American Blower Company, Detroit, Mich. Bulletin No. 283. Gives details of the construction of the Sirocco turbine type fan and describes the distinguishing features and constructional details. An interesting comparison of the Sirocco fan with the former standard steel-plate fan wheel is included. The illustrations include views of details of the fan and also a number of models ranging from large engine and motor driven fans down to the small Sirocco electric fan and air purifier, which was illustrated and described in *The Iron Age* May 26, 1910.

Information for Inventors.—The Engineer Searching Company, 1403 New York avenue, N. W., Washington, D. C. Series of ten pamphlets. Designed to give as clearly and briefly as possible the information required by an inventor in order that he may successfully secure a patent.

Spiral Riveted Pipe.—Abendroth & Root Mfg. Company, Newburgh, N. Y. Handbook No. 41. Size 4⅝ x 7½ in.; 108 pages. Relates to the Root spiral riveted pipe, which is manufactured in a large number of sizes and a great variety of fittings. Other articles described include two models of exhaust heads, valves and strainers, pumps, gravel elevators, hydraulic giants and smokestacks and flues. The pipe is furnished for a number of different styles of joint, such as the flanged joint, the bolted joint and the sleeve and crimped end slip joints provided with lugs for drawing up and carefully caulking to joint. A price-list of all the products mentioned in the handbook is included, and a complete index renders the finding of the description or the price of any article an easy matter.

Lighting Transformers.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 4022. Describes and illustrates a line of substantially built transformers which are guaranteed to carry a 25 per cent. overload for two hours and more excessive ones temporarily. An advantage of these transformers is that they are built to give 110, 220 or 440 volts on the secondary, so that the same transformer can be used for either power or lighting service.

Recording Thermometers.—The Bristol Company, Waterbury, Conn. Bulletin No. 125. Describes a self-contained recording thermometer for recording temperatures at the point where the instrument is located. One of the places where these thermometers are used to good advantage is in cold storage plants, and one of the illustrations shows a specimen record chart obtained in the egg storage room of a large cold storage and warehouse company. The illustrations include different styles of thermometers, among which are two new types, a portable round model for 8-in. charts and a small 6-in. wall model.

Gas Burners.—Gwynn Gas Burner & Engineering Company, 713 Empire Building, Pittsburgh, Pa. Catalogue. Illustrates and describes a line of natural gas burners for use with boilers of all types. The special advantages claimed are a sufficient supply of heat coupled with an economical consumption of gas. With these burners it is said that it is possible to attain a temperature of 4200 degrees F.

The Ohio Employers' Liability Law

Manufacturers of Ohio suffered, in the passage last April of what was known as the Matthews-Northrup bill, regulating and defining employers' liability in that State, what they term the most obnoxious legislation with which they have had to contend. The sections of the act to which the strongest exceptions have been taken are as follows:

Sec. 6245. That in any such action when it shall appear that the injury or death was caused in whole or in part by any of the following, to wit: The neglect of such employer in failing to properly furnish, maintain, construct, guard, repair, inspect or protect any of the ways, works, boats, wharves, plant, machinery, appliances or tools, in any way connected with, or in any way used in the business of the employer, in any manner required by statute law of the State or United States, any defective or unsafe condition in the ways, works, boats, wharves, plant, machinery, appliances or tools, except simple tools, in any way connected with or in any way used in the business of the employer, the fact that such employee continued in said employment with knowledge of such negligent omission or want of care or such defective or unsafe condition shall not be a defense unless by the terms of his employment it was expressly made the duty of such employee to report such neglect or such defective or unsafe condition to the employer, and the evidence discloses that such employee failed so to report, and that the employer was not otherwise possessed of knowledge of such negligent, unsafe or defective condition. Such employee shall not be held to have assumed the risk of the negligent act of any fellow-servant or employee of such employer, done in obedience to the immediate or peremptory instructions of or orders given by the employer, or any other person who has authority to direct the doing of said act; the want of necessary and sufficient rules and regulations or the lack of enforcement of same, for the government of such employees in the construction, operation and maintenance of such ways, works, boats, wharves, machinery, appliances, plant or tools, or the employing or retention of any incompetent servant.

Sec. 6245-1. That in all such actions hereafter brought, the fact that the employee may have been guilty of contributory negligence shall not bar a recovery where his contributory negligence is slight and the negligence of the employer is gross in comparison. But the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee. Provided, that no such employee who may be injured or killed shall be held in any degree to have been guilty of contributory negligence in any case where the violation of such employer of any statute or law of the State or United States enacted for the safety of employees in any way contributed to the injury or death of such employee, unless by the terms of his employment it was expressly made the duty of such employee to report such violation to the employer and the evidence shows that such employee failed so to report and that the employer was not possessed of knowledge of such violation. All questions of negligence, contributory negligence and assumption of risk shall be for the jury, under the instruction of the court.

Sec. 6245-3. That in all such actions, any contract, rule, regulation or device whatsoever, the purpose or intent of which shall be to enable any employer to exempt himself or itself from any liability created by this act, shall to that extent be void; provided, that in any action brought against any employer under or by virtue of any other provisions of this act, such employer may set off therein any sum he or it has contributed or paid to any insurance, relief, benefit or indemnity that may have been paid to the injured employee or the person entitled thereto on account of the injury or death for which said action was brought.

The bill was hotly contested, but it was finally passed. The Cincinnati Metal Trades Association, one of the largest in the United States, and whose members are mainly tool manufacturers, felt most keenly the retarding effects of the measure, and immediately set about to enact shop rules and regulations which would bring the employee equally under the effects of such precautionary measures as would assist in remedying existing evils. Secretary Manley has prepared for this purpose a special notice, to be given to every employee in the service of members of the association, and which he will be required to sign. This form reads as follows:

SPECIAL NOTICE.

It is hereby expressly made the duty of each employee of this company to report to his foreman or superintendent of the department the neglect of failing to properly furnish, maintain, construct, guard, repair, inspect or protect any of the ways, works, plant, machinery, appliances or tools in any way connected with or in any way used in the business of this company in said department, and to report the unsafe condition of same immediately to the foreman or superintendent of the department wherein such defective or unsafe appliances are maintained or used.

To report to his foreman or superintendent the want of necessary and sufficient rules and regulations, or lack of enforcement of same, for the government of employees of this firm or factory, or in connection with this ....., ..., or the retention of any incompetent servant.

To report to his foreman or superintendent the violation of any statute or law of the State or United States enacted for the safety of employees.

.....

Employer.

I, the undersigned, hereby acknowledge receipt of the above notice this ..... day of ....., A. D. 19....

.....

Employee.

Customs Decisions

Lower Duty on Iron-Nickel Wire

The Board of United States General Appraisers has given Herman Boker & Co., New York, the benefit of lower duty on importations of wire composed of iron and nickel. The wire, which is of complicated manufacture, is produced by forcing an iron core into a nickel tube and then drawing the combined article down to the required size. Duty was assessed on the wire at the rate of 45 per cent. under the tariff act of 1897, providing for iron or steel wire not specially provided for, whether uncovered or covered with metal. The importers' contention was that while the goods are dutiable under the same paragraph as assessed, the provision specifying iron or steel wire "coated" with metal, at the rate of 2.2 cents per pound is more applicable. General Appraiser Fischer in his decision for the board finds that the claim is well taken.

A $4 Duty on Ferrotungsten

The board has sustained protests filed by O. G. Hempstead & Son, regarding the classification of ferrotungsten, a ferroalloy used in the manufacture of special steels. Duty was assessed at the rate of 20 per cent. under the act of 1897 as "metals unwrought." The claim for a rate of $4 per ton under paragraph 122, by similitude to ferromanganese is sustained.

Plumbago Crucibles

A claim filed by J. B. Wise alleging lower duty on plumbago crucibles was overruled. Assessment under the provision in the act of 1909 for "mineral substances" is upheld.

"Nippers and Pliers" Include Pincers.

The Board of General Appraisers in overruling a protest filed by Jacob Friedenberg, an importer of New York, decided that the provision in paragraph 198 of the Payne-Aldrich tariff act for "nippers and pliers of all kinds" includes pincers, and the latter article is therefore held dutiable under that provision rather than under paragraph 199, as manufactures of metal not specially provided for at 45 per cent., or under paragraph 197 as machine tools. Duty was exacted at 8 cents a pound and 40 per cent. ad valorem under the provision for "nippers and pliers." The claims made by the importers called for duties either at 45 or 30 per cent., but neither of the contentions raised was allowed. The importer offered testimony that in trade and commerce the terms "nippers" and "pliers" do not include pincers. The board was not satisfied "that there is such definite, general and uniform commercial meaning of these terms as would require that they be read in other than their ordinary meaning."

August Wolf, Spokane, Wash., director of publicity of the Fifteenth National Irrigation Congress, states that officers of the International Lead & Iron Mining Company announce the finding of a body of iron ore near the boundary between Washington and British Columbia. The property is situated on and north of the international boundary, and the deposit is estimated to contain several million tons of commercial ore.

New Horton Face Plate Jaws

It is very important that face plate jaws be as adaptable as possible. It is customary to use an average size set of jaws on various engine lathes varying widely in size, and also often in the arrangement of slots. When these jaws are used on a lathe of only medium size and it is desired to hold small work they are apt to be more or less clumsy, as the manner of attaching does not allow them to run close together, being limited to the slots on the face plate.

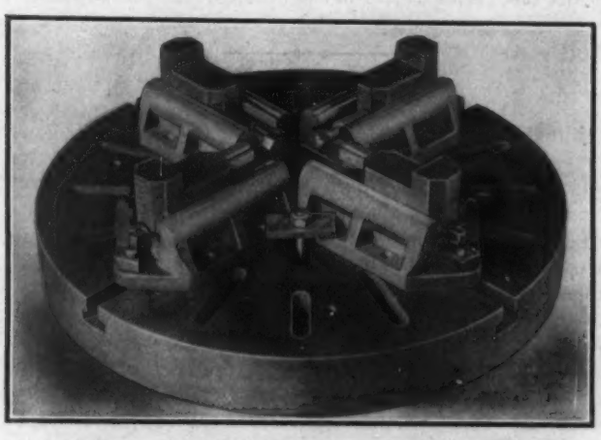


Fig. 1.—A Face Plate with Four of the New Jaws Made by the S. E. Horton Machine Company, Windsor Locks, Conn.

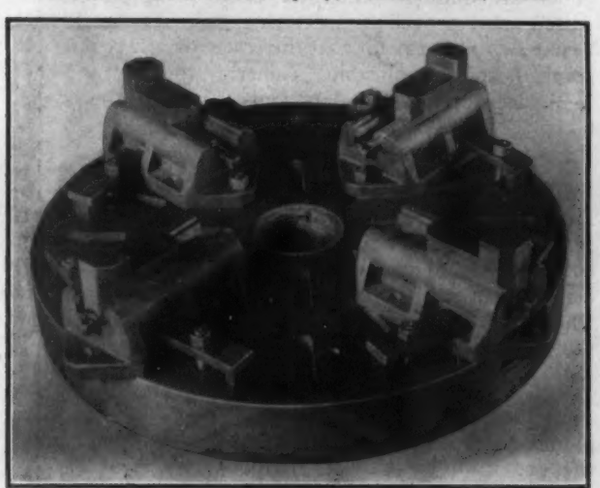


Fig. 2.—The Jaws Run Out to Hold Large Work.

In the new design, Fig. 1, made by the S. E. Horton Machine Company, Windsor Locks, Conn., the jaws being pointed at 45 degrees, fit together, practically coming to the center as closely as an ordinary chuck. When so run together they can be readily attached by the pockets which are formed in the side of the body. On the other hand, when used for holding very large work on a given size lathe, these new jaws can be run over the edge of the face plate, as shown in Fig. 2, and still be held by straps entering the pockets. One bolt can be left in the slot.

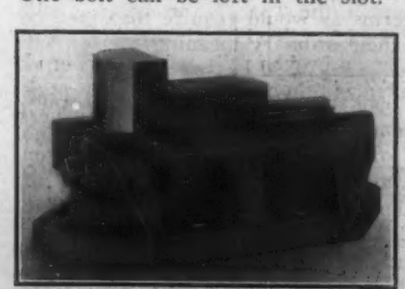


Fig. 3.—One of the Jaws.

The new pattern also gives a much better casting, as the metal is more uniformly distributed, and for a given weight the support is better, as the face of the jaw is wider. On either side of the body in the middle of the pockets holes are drilled which can be used for additional holding bolts, or are convenient for dowel pins. The sliding jaw shown in Figs. 3 and 4 has an operating screw of large diameter, and in general the jaw and screw are proportioned about like those in the company's new heavy pattern independent chucks, described in *The Iron Age*, December 2, 1909, which are much heavier than in the ordinary make. There are also double thrust bearings for the screw in the body, as the screw is not only fitted at either end, but has a bearing in the center. Thus four shoulders are obtained against which the screw bears to take up the end thrust.

These face plate jaws are made both in gray cast iron and in machinery steel castings. Any form of groove, or rib, or double ribs will be furnished, so that the body may fit any given slot or slots in the face plate. Special jaws can be furnished for holding special shaped pieces.

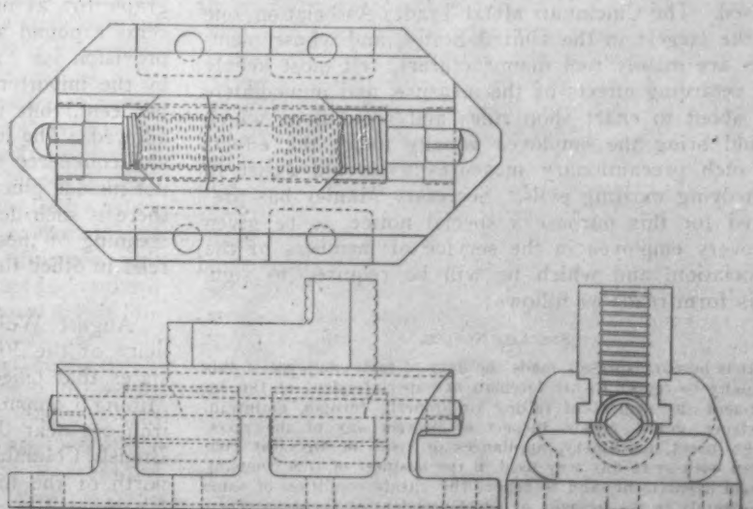


Fig. 4.—Plan and Side and End Elevations of a Jaw.

British Pig Iron Imports from China and India

The London *Iron and Coal Trades Review* says, after referring to the increasing pig iron production of China and the sending of Chinese pig iron to England: "More significant of the increasing competition which this country has to face is the fact that arrangements are at present under consideration for the import of a large tonnage of hematite pig iron, made in India, into this country. Presumably this iron will come from the works of the Bengal Iron & Steel Company, which has already built up a considerable export trade from India to Australia and other nearby markets. It does not seem probable that any imports of Indian pig iron will be made for some time yet, because the rainy season in India is just commencing, but the fact that prices at present admit of such a trade being done is one that is full of significance for the future. At present the output of India and China is small, but it does not follow that this will be the case in a few years' time."

The Pennsylvania Railroad System now has in service on its lines 704 all steel passenger cars and 1284 more have been ordered. In June, 1906, it was announced that all future additions to passenger equipment on the Pennsylvania system would be of all steel construction. The Pullman Company is at present building steel sleeping and parlor cars to equip the entire Pennsylvania system. These are now being delivered at the rate of from 50 to 60 a month. The steel passenger cars on the Pennsylvania system weigh 118,500 lb., as against 85,000 lb. in the standard vestibule wooden coach.

Centennial of the Lukens Iron & Steel Company's Plant

A History of the Oldest Plate Mill in the United States from Its Establishment at Coatesville, Pa., to the Present Time—A Commemorative Tablet to Be Unveiled July 2

With exercises appropriate to the occasion, in which the Chester County Historical Society will have an important part, the Lukens Iron & Steel Company, Coatesville, Pa., will celebrate on Saturday, July 2, the one hundredth anniversary of the establishment of its plant at its present location. This enterprise has had an interesting, as well as a most successful, business career. Its actual establishment dates back to 1780, when Isaac Pennock, the great grandfather of the two men now in charge, left his parents' farm to become an iron manufacturer. He went against the protest of his father, who at that time objected seriously to his "entering the hazardous iron business, particularly when wheat was selling at $3 a bushel and the influences of Great Britain were most detrimental to the success of the iron industry." Nevertheless, Isaac Pennock persisted in his undertaking, and in 1780 built a mill and began the manufacture of iron at a place now called Rokeby, situated on Buck Run, Chester County, Pa., about 4 miles south of Coatesville. He first built what was known as the "Federal Slitting Mill," in which charcoal slabs were heated in an open charcoal fire, rolled out into plates and then slit up into rods for general blacksmith use, the slabs being obtained from charcoal iron bloomeries with which the neighboring valleys were dotted. Notwithstanding that he had been raised as a farmer, he was particularly successful in this pioneer industry.

The Original "Brandywine Mill"

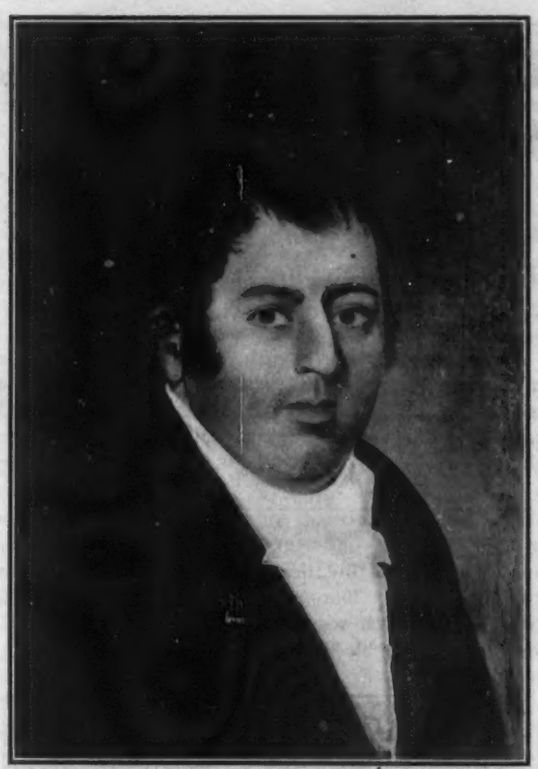
In 1810 Mr. Pennock purchased a saw mill property on the Brandywine Creek, at what is now Coatesville, the deed for which bears the date July 2. The year 1810, therefore, is taken as that of the location on the present site of the beginnings of the large plant at present in operation, covering many acres of ground and giving employment to many hundreds of men. The saw mill was altered to make it serve for the needs of an iron mill, which was variously called the "Brandywine Mill," "Brandywine Iron Works" and "Brandywine Rolling Mill." Authentic data regarding the operation of the plant in its early days are meager. In 1816 Dr. Charles Lukens, son-in-law of Isaac Pennock, and maternal grandfather of the present managers, came into possession of the property. From that year a quantity of authentic documentary evidence in connection with the plant is available. Dr. Lukens carried on the business of iron making until his death in 1825, and it was between 1816 and 1825 that the first boiler plates were rolled on the old mill under the management of Dr. Lukens. There was some expansion under this administration. In addition to the slitting of rods and the rolling of plates and sheets the manufacture of nails was engaged in. Documents under date of August 16, 1819, show the conveyance of the exclusive rights and privileges of William Reeves in five nail making machines for the manufacture of certain sizes of nails, within a district of 50 miles of the city of Philadelphia, during the life of the patents, which were dated 1811, 1812 and 1813. The successful manufacture of nails by Dr. Lukens is shown by the further acquisition of such machinery, the patent right and privilege of using one such machine being transferred to Dr. Lukens by deed of conveyance "in 4 month 10th, 1821, for the sume of Two hundred and fifty dollars," by Thomas Gillingham.

Boiler Plates First Rolled in 1820

The manufacture of rolled boiler plates is believed to have been first undertaken about 1820. The original plates were made on the old mill from single charcoal iron blooms, the blooms being made in old-fashioned forge fires, which were quite numerous in the neighborhood. These blooms were reheated over an ordinary

ISAAC PENNOCK, the Founder.

grate fire, the exact type of which is not now known, and were then rolled into plates or sheets. The plates were not sheared, being at that period shipped rough, the shearings at a later date being cut into nails. The plate rolls at that time, as near as known, were about 16 in. in diameter and from 3 to 4 ft. long between the housings. They were driven by an overshot water wheel directly connected with the roll train and without a flywheel. Many times, when it seemed probable that the mill would stall, the workmen would rush for the water wheel, climb up on its rim and by their united weight help to complete the "pass" through the rolls, thus preventing a "sticker," which invariably meant fire cracked and later on broken rolls. With this crude mill sheets were rolled as thin as No. 28 gauge, in packs of three. Owing to the constant increase in business, which necessitated more power, the overshot wheel was afterward supplemented by a breast wheel so geared that it would convey more power to the rolls, and in addition a flywheel was introduced geared to high speed for the storage of power. This permitted of the use of larger rolls, which were changed to 21 in. in diameter and 66 in. long. A reverberatory furnace was later



DR. CHARLES LUKENS, the Founder's Successor.

installed, enabling the scrap from the plate shearings to be worked up.

Reaching Markets by Wagon

The marketing of the product was a serious problem in the early days. The raw material was hauled from the neighboring forges by team; the charcoal fuel used came from the immediate vicinity of the mill, and later semi-bituminous coal was hauled from Columbia, 42 miles away. The finished material had to be teamed to Philadelphia, a distance of 38 miles, or to Wilmington, 26 miles. As shown by old receipts, the cost of teaming to Philadelphia was $4 a short ton, while water transportation from that port to New York by schooner was $1 a ton. This rate applied alike on plates, sheets and nails. An interesting agreement between Dr. Lukens and Edward Smith & Son in connection with the marketing of sheet iron reads as follows:

A PLATE AND SHEET CONTRACT OF 1824.

Doctor Charles Lukens agrees to sell Edward Smith & Son Twenty Tons Sheet Iron to be rolled from the best Pennsa. Bar Iron single double or treble rolled the above Sheet Iron not to exceed nine feet in length and thirty inches in width from No. Twelve to Twenty-eight For the wire gauge as we may order at One Hundred and Forty Dollars Per Ton Payable the 1st day of March 1825 Edward Smith & Son to have the Privilege to Increase the Quantity to Forty Tons The said Charles Lukens not to Sell to any Iron Store in Philada. for a less Price than One hundred and forty five Dollars Nor not to sell Sheet Iron to Manufacturers in Philada. and not to Sell for the New York Market at a less Price than One Hundred and forty five Dollars Per Ton delivered in Philada. In case the above Order is Increased to Forty Tons Charles Lukens to be Informed of it by the 1st of August 1824 that he may have time to order the Bar Iron.
Philada. March 11th 1824.

EDWARD SMITH & SON
CHARLES LUKENS

The Management of Rebecca W. Lukens

Dr. Lukens, then a young man, died in 1825, and in accordance with his special request was succeeded by his widow, Rebecca W. Lukens. She continued the business successfully, notwithstanding the tremendously unfavorable influences which affected the trade. Mrs. Lukens carried on the manufacture of plates, sheets, rods and nails, with the assistance of a superintendent to look after the works and employees, while she herself assumed full control and management of the commercial end of the business. She was considered an extraordinary business woman and built up a business which has remained in the family for four generations and has been continuously successful.

Agreements made by Mrs. Lukens for the purchase of crude material, as well as for the sale of finished products, are interesting, not only in a historical way, but also in the method of arriving at a basis of prices, and several contracts are herewith given in full. In that of James Sproule, "for 100 tons of sound boiler plates trimmed square, &c.," the word "plates" is understood to refer to blooms. It is also noticeable that at that date the practice of trimming the ends of blooms had been adopted, while in the earlier days, as stated above, they were left untrimmed and the rough ends used for nail making purposes.

A CONTRACT FOR BLOOMS.

I engage to deliver at the Brandywine Rolling Mill 100 tons of Sound Boiler plates trimed square at the ends suitable to Roll into Boiler plate Iron and 50 Tons of Broad flat Barrs suitable for Sheet Iron such sizes as may be ordered and the ballance of the Iron made at the Saddsbury forge drawn to such Sizes as may be ordered to roll into hoopes for nail Iron at the prices paid by Jas. Rowland to Cyrus Jacobs with the deduction of four dollars per Ton off those prices for hauling to Philada. The payments to be made agreeably to those made to Cyrus Jacobs by Jas. Rowland and the settlements to be made accordingly. The contract to continue from this date up to the 1st of April 1827. The iron to be of as good a quality as heretofore furnished.
Brandywine Iron Works May 10th 1826.

JAMES SPROULE.

A SALES CONTRACT FOR BOILER PLATES.

Rebecca W. Lukens agrees to furnish Edward Smith & Son with one hundred & forty sheets ¼ inch boiler Iron cut to Coffee's pattern also the Iron ordered from the two patterns sent out for Rush & Muhlenburg at Five dollars higher than the permiscuous boiler Iron, when the new contract commences for one year from the 1st of April next for all the boiler & Sheet Iron rolled at the Brandywine Works except completing a contract for Tank Iron say about Fifty Tons, with the liberty of selling Sheet Iron to the Country, say Reading and Lancaster. Boiler Iron at Fifty five dollars per Ton ⅛ inch flue or Sheet Iron at Fifty dollars per ton higher than slab Iron—Sheet Iron at Seventy dollars per ton higher than the price for Bar Iron on a Credit of four months from the delivery of each and every Twenty tons to the first of December 1826.—then from that time to the first of April 1827 the Credit to be Six months upon the delivery of every Twenty tons, provided Edward Smith &

REBECCA W LUKENS, Manager 1825-1847.

DR. CHARLES HUSTON, Manager 1850-1897.

Son find the Iron dull sale and their stock accumulates. Quantity of boiler & sheet iron to be rolled Supposed to be say from two hundred to two hundred and fifty Tons, the price of Slab and bar Iron to be regulated by James Rowland's price to Cyrus Jacobs, the boiler & Sheet Iron to be rolled such thicknefs as Edward Smith & Son may order, and all boiler or sheet Iron cut to pattern Ten dollars per ton higher than the price of permiscuous Iron, and it is further understood that the Boiler & Sheet Iron is to be rolled in a Superior Style, say as heretofore.

EDWARD SMITH & SON.
For REBECCA W. LUKENS,
J. W. PENNOCK.

The formal method of making agreements for labor in connection with work on nail making machines, prevalent at that early date, is shown by the following:

AN EARLY LABOR CONTRACT.

Memorandum of an agreement made and finally concluded on by and between Rebecca W. Lukens of the one part & Morris Clarke of the other part—Witnesseth That the said Morris Clarke agrees to cut nails on the Machine he has for some time been cutting on of all the different sizes cut on said Machine & agreeably to R. W. Lukens orders. He is to run the Machine from five in the Morning untill Seven in the evening, allowing one & ½ hours each day for meals and to receive for cutting the price paid by Reeves & Whitaker at the Phoenix Works.

The said Morris Clarke further agrees to forfeit & pay the sum of twenty-five cents per hour for each & any hour he is absent from his business provided the Factory is capable of doing business, sickness & unavoidable accidents excepted.

This agreement to continue untill the first day of 10 month next ensuing the date hereof.

Witness our hands & Seals this 13th day of 10 month 1828.

R. W. LUKENS (Seal)
MORRIS CLARKE (Seal)

An idea of the productive capacity of the plant under Mrs. Lukens' management is conveyed by a traditional effort to increase production, she promising her employees a premium if they would raise the yearly production up to 500 tons. Unfortunately the exact year referred to is not known.

The difficulties experienced in operating the plant during these years were many. Alternations of prosperity and extreme quietness in the trade prevailed. Documentary evidence refers to the dullness in the early forties, due to tariff uncertainties, when employees then working on half time, with a sheet iron banner on a pole, on which was lettered the following verse, composed by Mrs. Rebecca W. Lukens, took active part in a higher tariff campaign:

We fondly hope for better days,
When every furnace fire shall blaze,
And streaming to the midnight sky,
Proclaim to all Prosperity.

In those wasteful days of fuel consumption flame issued from the chimney tops in large volume.

A reduction in the tariff in 1844 resulted, it was stated, in a period of great depression.

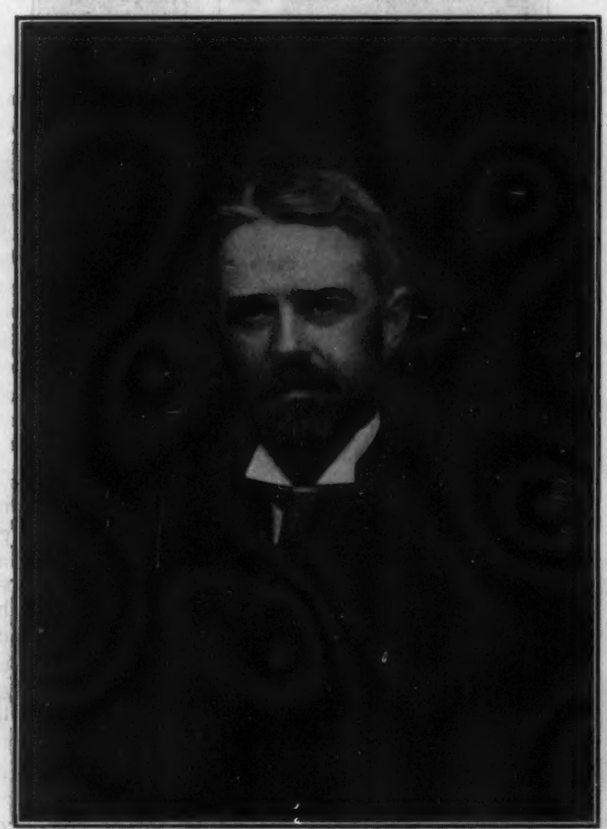
After Mrs. Lukens' death, she having carried on the business for 22 years, the management of the business fell to her sons-in-law, Abram Gibbons and Dr. Charles Huston, and the name of the mill was changed, in honor of Dr. and Mrs. Lukens, from "Brandywine" to "Lukens." Mr. Gibbons retired in 1855, after an honorable, although short, business career, leaving the work in Dr. Huston's hands. The latter, with a later partner, Charles Penrose, carried on the manufacture of iron up to the time of Mr. Penrose's death in 1881, they having been joined by Dr. Huston's two sons, A. F. Huston and C. L. Huston, upon their graduation from college in 1872 and 1875, respectively. Dr. Huston remaining at the head of the concern until his death in January, 1897.

A. F. HUSTON, President Lukens Iron & Steel Company.

Dr. Charles Huston's Career

A history of the business would not be complete without a fuller reference to Dr. Huston's life and his influence in the upbuilding of the company's plant, as well as his close connection with the development of the iron and steel industry of the country. He was born in Philadelphia in 1822, graduated at the University of Pennsylvania in 1840, and finished a three years' course in medicine at the Jefferson Medical College in 1843, which was supplemented by 18 months of special study in Europe. He began the practice of his profession in Philadelphia, married Miss Isabella Pennock Lukens of Coatesville, and settled down to the life of a doctor. In 1849 they moved to the country. He entered the iron business in 1850 and for nearly 50 years was actively engaged in it. In 1875, when the United States Government began requiring that plates used in the construction of steamboat boilers should be stamped with their tensile strength, Dr.

Huston promptly purchased a testing machine and began investigating the physical properties of iron and steel. In 1877, when the manufacturers of boiler plate were requested by the Treasury Department to send a committee to Washington to advise with the Board of Supervising Steamboat Inspectors in framing a proper standard of tests, Dr. Huston was chosen chairman of that committee. With his practical knowledge of the character of metal and his experience in testing, his recommendations were adopted by the Board of Inspectors, and in addition his counsel was frequently sought by the Government. His recommendations were sought and followed by the leading steam boiler inspection and insurance companies of the country, and also by the committee appointed by the City Councils of Philadelphia, in establishing their standard of test requirements for high grade boiler plates. In 1878-79 he published articles in the *Journal* of the Franklin Institute upon the behavior of iron and steel under varying conditions of heat and stress. These attracted the notice of engineers abroad years afterward, when the latter had just taken up that class of investigation. In 1895 Dr. Huston was selected by the Hon. Chauncey M. Depew as the man best fitted by ability and experience to write the article on the "Iron and Steel Industry" for Mr. Depew's comprehensive history of "One Hundred Years of American Commerce." Dr. Huston's scientific education, natural ability and high



CHARLES L. HUSTON, Vice-President Lukens Iron & Steel Company.

personal character have permeated all departments of the Lukens Works.

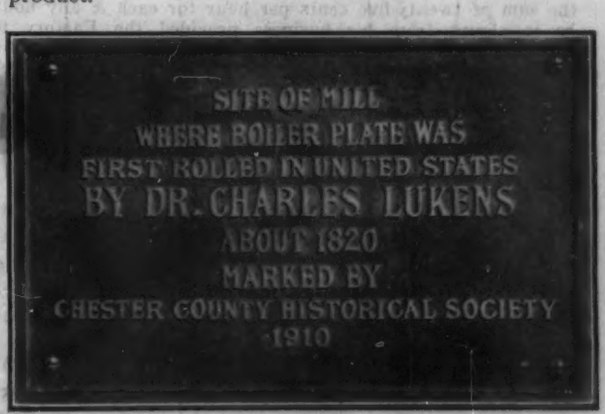
The Modern Lukens Plant

The year marking the active development of the present great plant was 1870, when a modern steam plate mill was erected near the old water power mill. On the new mill, which was of the two-high type, chilled rolls 28 in. in diameter and 84 in. long were used, and later the "Old Mill" was changed into a puddling mill to prepare stock for the new mill. Changes came rapidly, as the demand for longer and wider plates increased steadily, and the use of steel plates became more universal. In 1890 there was erected a three-high mill with chilled rolls 34 in. in diameter by 120 in. long weighing 18 tons each. This was then the largest mill of its kind ever erected in the United States. It was driven by a large Corliss engine and was equipped with automatic lifting tables and mechanical apparatus for transferring the plates to the hydraulic and steam shears. Other improvements were added from time to time, including straightening rolls so situated as to take the plates as they came, still hot, from the mill and transform their irregular surface to a true and regular one.

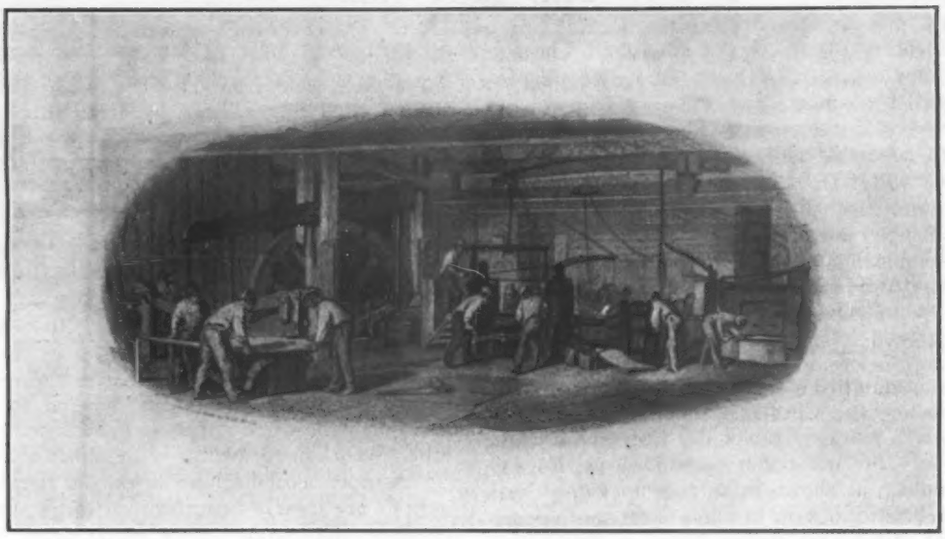
Open Hearth Furnaces Built

In 1899 a 48-in. universal mill was added, enabling plates with rolled edges, from 8 in. up to 48 in. in width and 100 ft. long and over, to be rolled. For a long time steel slabs were purchased in the open market, and frequently heavy purchases of foreign slabs were made, but in 1891 two open hearth furnaces were built, establishing what is known as the No. 1 open hearth department. To this additions were later made until six furnaces were built. In 1899 the No. 2 open hearth department was established with nine 50-ton furnaces which are now in use, more than doubling the productive capacity of the plant for open hearth steel. In 1902 a massive slabbing mill was erected, second to none in the country either in size or design.

The policy of the late Dr. Charles Huston has been consistently followed. He frequently remarked that it was "better to be ahead of the times than one whit behind." In the summer of 1903 another mill was put in operation, still larger than any of its predecessors, having rolls 140 in. wide and capable of rolling plates up to 136 in. in width. The latest and most approved ideas of mill construction were followed in the building of this mill, with the capacity and width of plate second to none then in existence. A record run of this mill at that time was 413 tons of finished plates, rolled and sheared complete, in 11½ hours. However, this can now be materially exceeded. This mill is equipped with three continuous furnaces of the horizontal type and two pit furnaces each with four pits. Electric traveling cranes handle the raw and finished product, and there are two hydraulic shears with a capacity of shearing plates 2¼ in. thick, in addition to which four large steam shears complete the equipment of the mill. The 120-in. mill, which was later enlarged to 36 x 134 in., was in 1904 reduced in length of rolls to 112 in., the diameter remaining at 36 in., thus making it an exceptionally stiff mill, capable of rolling plates up to 108 in. in width and of extreme thinness. Plates 108 in. in width down to 3-16 in. in thickness and 96 in. wide and ⅛ in. thick have been rolled on this mill, with a remarkable uniformity of thickness throughout. All the finishing mills, embracing the 140, 112 and 84 in. sheared plate mills and the 48-in. universal plate mill, are equipped with straightening rolls to flatten the rolled plates as soon as they leave the mills while still red hot, resulting in a uniform and most perfect product.



The Memorial Tablet, to Be Unveiled July 2, 1910.



The Original Plate Mill.

Extent of the Present Plant

The present property of the Lukens Iron & Steel Company covers an area of over 200 acres, upon which stand 13 large buildings, including the 140-in. plate mill, the 48-in. universal mill, No. 2 open hearth steel plant, containing nine open hearth furnaces; 34-in. slabbing mill, capable of rolling slabs and blooms weighing up to 20,000 lb.; slabbing mill boiler house; 22-in. puddle mill, now used for other purposes; 84-in. plate mill; 112-in. plate mill; No. 1 open hearth steel plant, containing six furnaces; No. 10 boiler brace and trolley pole shop, machine shop, structural shop, and the gas producer plant for the east side. In addition there is a vast number of smaller buildings incident to the operation of such a large plant. The location of the various departments is shown in an illustration herewith, and in contrast a view of the original mill of 1820 is given. The product of the works includes all classes of boiler and flat structural steel for building purposes, for bridges, ships, &c., flanged work, much of which is covered by the company's own patents, and a variety of steel plate products in demand in all parts of the United States and wherever American commerce extends.

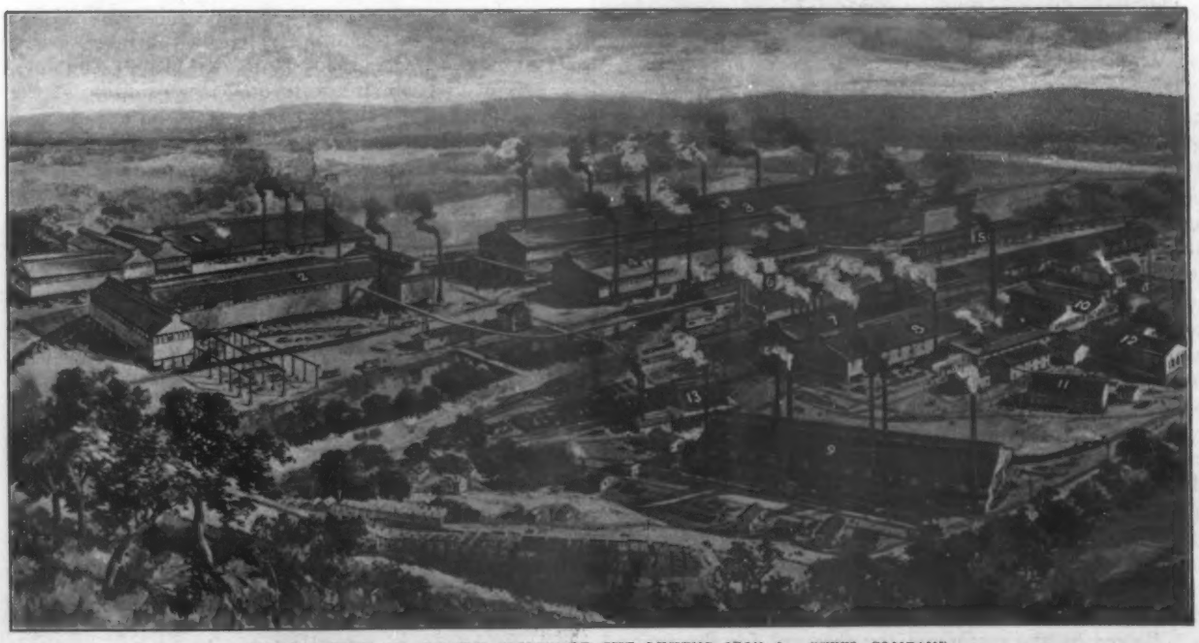
Contrasts in Output

Interesting statistics as to the output of this plant show that whereas by strenuous effort Mrs. Lukens obtained a yearly product of 500 tons the plant produced in the year 1875 a total of 2135 tons of iron plates. In 1890 2945 tons of iron and 11,445 tons of steel plates were rolled. In the early eighteen-nineties the production of iron plates steadily decreased, and by 1898 was entirely discontinued. In 1900 the output of steel plates was 64,714 tons, while in the fiscal year July 1, 1909, to July 1, 1910, the total output was 225,000 tons. The capacity of the plant running full is approximately 250,000 tons, but with modifications, which could be made at a comparatively low cost, this could be raised to 350,000 tons yearly.

The number of men employed in the "Old Mill," early tradition says, was not over a dozen. In 1870 the total number was 23, while at the present time it is 1650, and in times of greater activity easily reaches 2000, making this enterprise a tremendous factor in the commercial life of Coatesville.

Incorporation of the Company

In 1890 the concern was incorporated as the Lukens Iron & Steel Company. The first officers were the following: President, Dr. Charles Huston; vice-president, A. F. Huston; treasurer, Joseph Humpton; secretary, R. B. Haines, Jr. After the death of Dr. Huston in 1897 A. F. Huston succeeded to the presidency. C. L. Huston was elected vice-president and Joseph Humpton secretary and treasurer, and these officers have



GENERAL VIEW OF PRESENT WORKS OF THE LUKENS IRON & STEEL COMPANY.

1, 140-In. Plate Mill; 2, 48-In. Universal Mill; 3, No. 2 Open Hearth Plant; 4, 34-In. Slabbing Mill; 5, Slabbing Mill Boiler House; 6, 22-In. Puddle Mill; 7, 84-In. Plate Mill; 8, 134-In. Plate Mill; 9, No. 1 Open Hearth Plant; 10, Boiler Brace and Trolley Pole Shop; 11, Machine Shop; 12, Structural Shop; 13, Gas Producer Plant.

continued in service up to the present time. The following are directors: A. F. Huston, C. L. Huston, Joseph Humpton, Benjamin Miller, Howard Taggert and H. B. Spackman. A commodious fireproof office building of model arrangement was added recently, in which the headquarters of the officers of the company are established. Branch offices of the company are located in Philadelphia, New York, Boston, Baltimore and New Orleans, with selling agencies in Cleveland and Chicago, St. Louis, Los Angeles, San Francisco, and in Montreal, Canada.

Centenary Celebration and Commemorative Tablet

No small part will be taken in the celebration of this centennial by the Chester County Historical Society, which will mark by tablet the site of the "Old Mill," in which the first boiler plate in America was made. The tablet, as shown in an accompanying illustration, is of bronze, 9 x 14 in., and bears the inscription, "Site of Mill where Boiler Plate was first rolled in the United States, by Dr. Charles Lukens, about 1820, marked by Chester County Historical Society, 1910." It will be placed on a granite pillar, erected at the site of the old plant. The following programme for the celebration on July 2 has been arranged:

1.30 p.m.—Lunch to invited guests on lawn of President A. F. Huston.

2.00 p.m.—March of workmen carrying inscribed banners.

3.00 p.m.—Addresses in open lot on the banks of the Brandywine, near Main street. Speeches by ex-Governor Samuel W. Pennypacker, Dr. G. M. Philips of the State Normal School, President A. F. Huston and others, including John Fritz, if able to attend.

4.00 p.m.—Refreshments to all the workmen.

Following the above comes the unveiling of the bronze tablet by the Historical Society.

The committee in charge of the celebration is made up jointly of members of the Chester County Historical Society and gentlemen identified with steel manufacture in Chester County, as follows: A. F. Huston, Charles L. Huston, William M. Potts, William H. Gibbons, Horace B. Spackman and William H. Hamilton of Coatesville; Dr. G. M. Phillips, Gilbert Cope, George B. Johnson, Dr. J. E. Harlan, Charles R. Hoopes and L. K. Stubbs, West Chester, Pa.

New Publications

Self-Taught Mechanical Drawing and Elementary Machine Design. By F. L. Sylvester, with additions by Erik Oberg. Size, 5 x 7½ in.; 330 pages, 215 illustrations. Price, $2. Published by the Norman W. Henley Publishing Company, New York City.

This is a practical treatise on mechanical drawing and machine design comprising the first principles of geometric and mechanical drawing, workshop mathematics, mechanics, strength of materials and the calculation and design of machine details, presented in such a way as to meet in particular the needs of the student, whose previous theoretical knowledge is limited. The author's aim has been to adapt this treatise to the requirements of the practical mechanic and young draftsman and to present the matter in as clear and concise a manner as possible. To meet the demands of this class of students, practically all the important elements of machine design have been dealt with, and in addition algebraic formulas have been explained, and the elements of trigonometry treated in the manner best suited to the needs of the practical man. The book is divided into 20 chapters, and in arranging the material, mechanical drawing, pure and simple, has been taken up first as a thorough understanding of the principles of representing objects facilitates the futher study of mechanical subjects. This is followed by the mathematics necessary for the solution of the problems in machine design, which are presented later and a practical introduction to theoretical mechanics and the strength of materials. The various elements entering into machine design, such as cams, gears, sprocket wheels, cone pulleys, bolts, screws, couplings, clutches, shafting and flywheels have been treated in such a way as to make possible the use of the work as a textbook for a continuous course of study. It is easily comprehended and assimilated even by students of limited previous training.

Dynamo Building for Amateurs. By A. J. Weed. Size, 5 x 7½ in.; 110 pages, 64 illustrations. Price, cloth bound, $1; paper covers, 50 cents. Published by the Norman W. Henley Publishing Company, New York City.

This book is a practical treatise showing in detail the construction of a 50-watt dynamo for which the entire machine work can be done on a small foot power lathe. Working drawings with dimensions are given for each piece of machine work and the different operations are clearly described. A large number of the half-tone illustrations were made from photographs of the machine work as it was being done, and show the lathe set up with the necessary tools in position and the actual operations in practice. The machine when used as a dynamo will generate enough current to light six 6-cp. miniature lamps, and when used as a motor will drive a small press, lathe, or sewing machine. The book is divided into 13 chapters, each of which deals with the construction of some part of the machine.

Concrete from Sand Molds. By A. A. Houghton. Bound in cloth. Size, 5 x 7½ in.; 192 pages; 12 illustrations. Price, $2. Published by the Norman W. Henley Publishing Company, New York City.

This book is a practical treatise explaining a simple system of molding ornamental and plain concrete with sand molds, and is a companion to "Ornamental Concrete Without Molds," which was reviewed in *The Iron Age*, June 2, 1910. The process of molding concrete described in this volume is of very practical value, as its possesses a number of advantages, such as low cost of molds, easy and rapid operation, a perfection of ornamental detail, increased strength of the concrete, perfect curing of the work without any attention, and the ease with which the molds can be moved irrespective of any undercutting the design may have. The author has endeavored to give in plain language a complete and comprehensive explanation of the process and care has been taken to make the exact meaning clear, as it has been assumed that the reader is entirely unacquainted with the principles of the process and desires information which he can apply to his every-day work. The book is divided into 15 chapters, the first two of which are devoted to an outline of the origin and principles of the process. The mixing and preparation of the material for the molds and the making of the molds from patterns of wood, metal, clay, plaster, concrete, and other substances is next described. This is followed by chapters on the use of plates between the sections of the mold to make them easily separable and the method of core making. The last eight chapters deal with the use of the molds and show how to combine several molds to form one large piece, producing simple rock effects and ornamental designs, hollow concrete building blocks, and the use of facings, such as crushed granite, marble flour, and other substances to produce a fancy finish.

"Safeguards" is the title of a book, bound in stiff paper, recently published by the Aetna Life Insurance Company, Accident and Liability Department, Hartford, Conn. There are 150 pages of text, for the most part suggestions for the prevention of accidents, with a large number of illustrations of safeguards in shops, and descriptions of methods adoopted in different plants to guard dangerous places and machinery. The book is another proof of the vast amount of intelligent and effective work now being put on this subject.

The Thompson Universal Grinder

A Tool Room and Manufacturing Machine for All Kinds of Grinding

A universal grinding machine designed to combine efficient means for accomplishing every grinding operation that may be required in the tool room and general shop is built by the Thompson Grinder Company, Springfield, Ohio. Among the important features of this machine are the fixed grinding wheel head, all adjustments being made in the work supports, the water attachment, the quick change feed mechanism to the table, and the simple design of the countershaft.

The grinding wheel being maintained in a fixed position, the table carrying the work to be ground is made adjustable to any position relative to the wheel. This principle of construction is peculiar to this grinder. The head is rigidly mounted upon the column that is solidly attached to the base, and surrounding the column is a trunk or body casting that revolves upon a bearing on the base. This body casting carries the elevating knee, saddle casting and grinding table, which may be placed at either end, parallel to it, or at any intermediate position, thus the machine can be converted in a moment into either a plain grinder for grinding straight or taper work between centers, a surface grinder, a knife grinder, an internal grinder, a die grinder, or a cutter grinder, each of which is efficient in its action.

Fig. 1 shows a front view of the machine as it appears when converted into a plain grinder for grinding work between centers, straight or taper, up to 10 in. in diameter by 36 in. long. In this position the overhead drum of the countershaft is parallel with the table, and by a weight the drum is automatically adjusted to the hight of the grinding table, thus keeping a uniform tension on the belt.

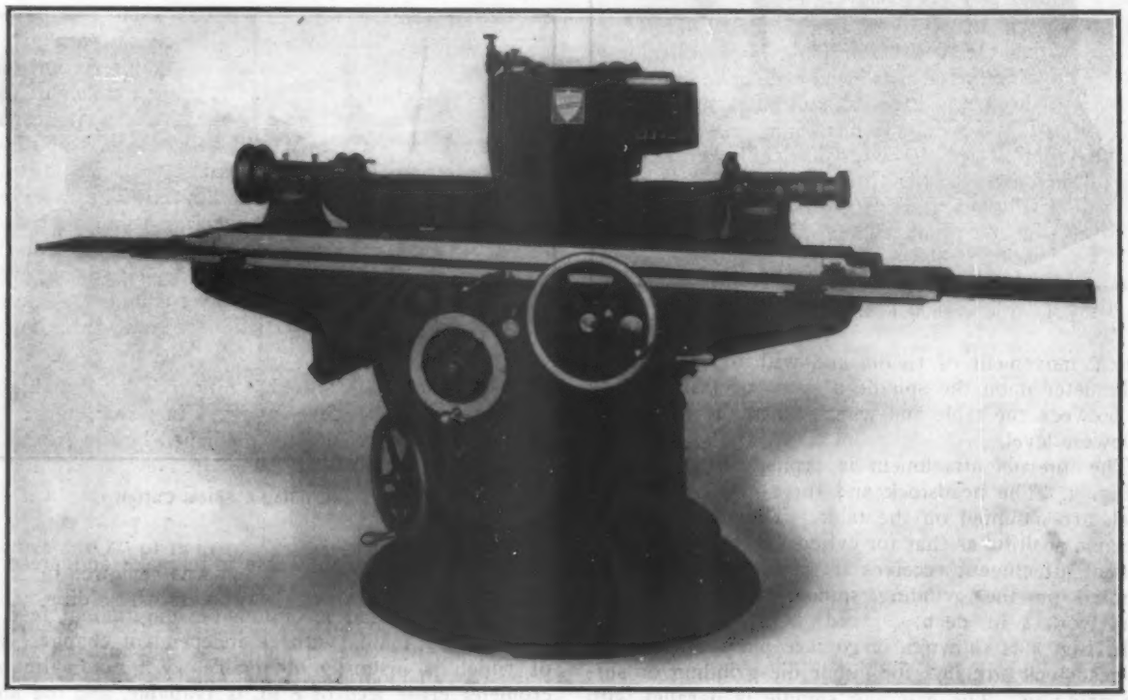


Fig. 1.—The Universal Grinder Built by the Thompson Grinder Company, Springfield, Ohio, as Arranged for Plain Grinding.

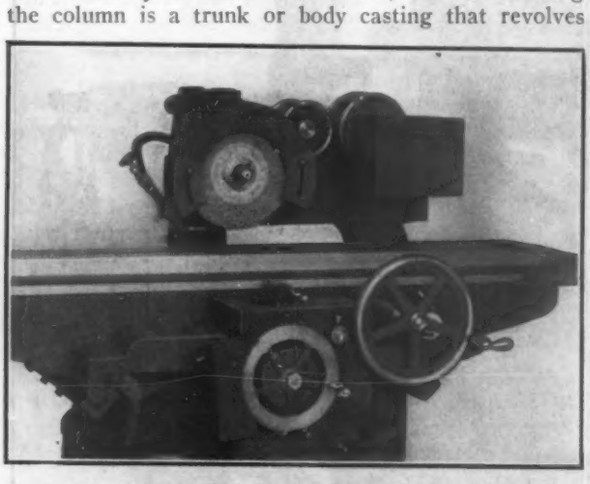


Fig. 2.—The Thompson Grinder as Arranged for Surface Grinding.

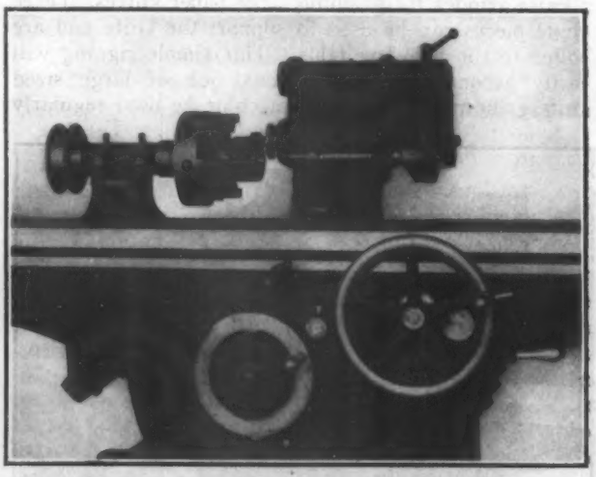


Fig. 3.—The Grinder Set Up for Internal Grinding.

In Fig. 2 the grinder is shown arranged for surface grinding. The spindle and grinding head overhang the table, so that the full width of the table, which is 8 in., may be passed laterally beneath the wheel. The traverse of the table is 48 in., and, therefore, work 8 x 48 in. may be surface ground. The knee has a

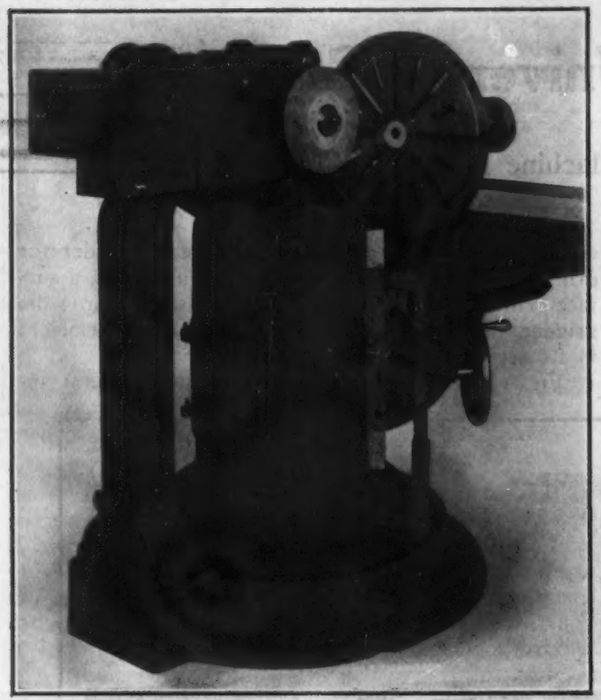


Fig. 4.—The Machine Equipped for Die Grinding.

vertical movement of 10 in., and with a wheel 10 in. in diameter upon the spindle a space of 5 in. will be left between the table and wheel, when the table is at its lowest level.

The internal attachment is applied to the grinder in Fig. 3. The headstock and three-jaw combination chuck are mounted on the table. The machine is in the same position as that for cylindrical grinding. The internal attachment receives its power from a pulley mounted on the grinding spindle proper, and will grind work 4 in. deep.

In Fig. 4 is shown a large face plate mounted on the headstock adjusted for either die grinding or surface grinding. The grinding spindle is parallel with the face plate. The grinder may be converted also into a knife grinder for grinding large paper knives. Three angle pieces can be used to support the knife and are bolted to the grinding table. This simple rigging will easily accomplish the occasional job of large sized knife grinding. Should the machine be used regularly for this particular work an attachment can be furnished for holding the knife at any angle, and at the same time affording a support throughout its length.

A grinding wheel will cease to be effective for accurate work when either the wheel and its support or the work begins to vibrate. This vital point has received particular consideration in the design of the Thompson universal grinder, and it was to eliminate vibration from the wheel that the head was made stationary. Confining the movements to the table and fixing the grinding head simplified the problems of accurate and durable construction. The table moves past a fixed cutting point, thus insuring permanent accuracy of work when the long ways are once made straight, and the builder claims to have the design, experience and special tools that enable it to make and preserve straight ways.

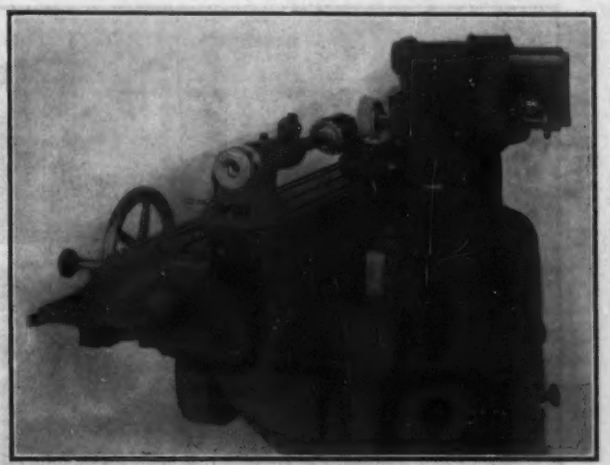


Fig. 6.—Grinding a Spiral Cutter.

The grinder has an automatic longitudinal feed to the table of 48 in., with 10 independent changes, any of which is instantly obtainable. An automatic micrometer cross feed of 8 in. is available, and the knee has a hand vertical micrometer adjustment of 10 in.

As has been stated, the grinder is capable of being converted into at least five distinct kinds of grinders, any of which is capable of as economical production as if it were a special machine for that single purpose. Aside from these distinct kinds of grinding the grind-

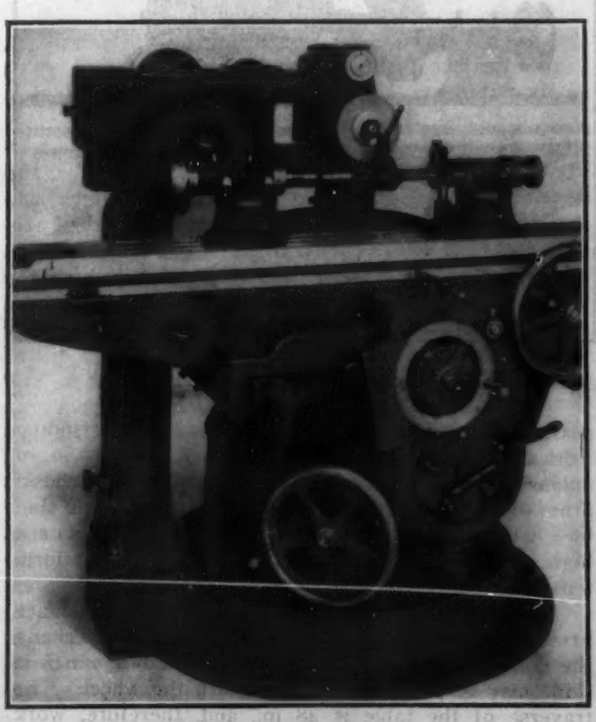


Fig. 5.—Grinding a Hob.

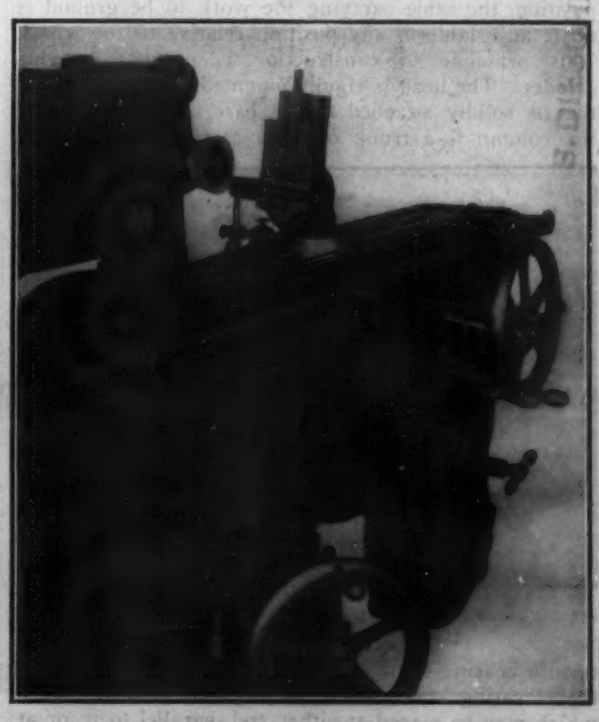


Fig. 7.—Grinding an End Mill.

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ing of hobs, spiral cutters, end mills, &c., can be taken care of, as shown in Figs. 5, 6 and 7.

In Fig. 8 are shown some of the interior details, giving an idea of the arrangement of the gears for doubling the number of feeds in the quick change gear box, shown in Fig. 9. The pulleys marked A and A′ act as idler pulleys, and the belt from the line shaft makes a right angle turn on these pulleys passing around the pulley mounted on the spindle B. The pulley A drives at one end of its shaft a pair of 45-degree angle spiral gears, C, which, through a shaft extending to the base of the machine, operate the pump for the water attachment. On the other end of the pulley shaft, A, is mounted the worm D, meshing with a worm wheel on the same shaft with the pull pin E. The latter operates a sliding key, which engages either gear F or gear F′ to drive either gear G or gear G′, giving two rates of feed. From the gear G′ the drive

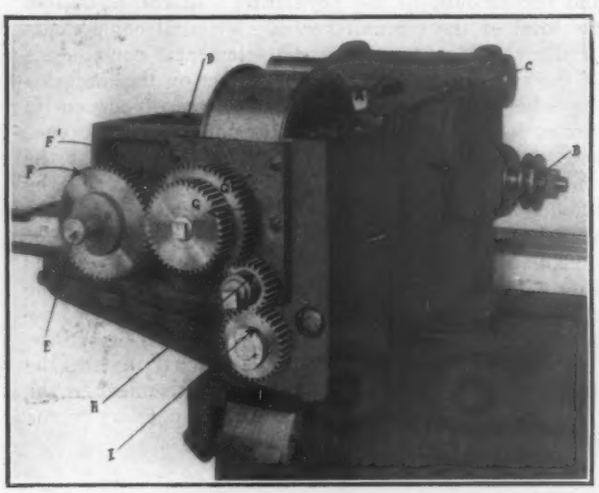


Fig. 8.—Interior Details Showing the Drive of the Spindle and Feed.

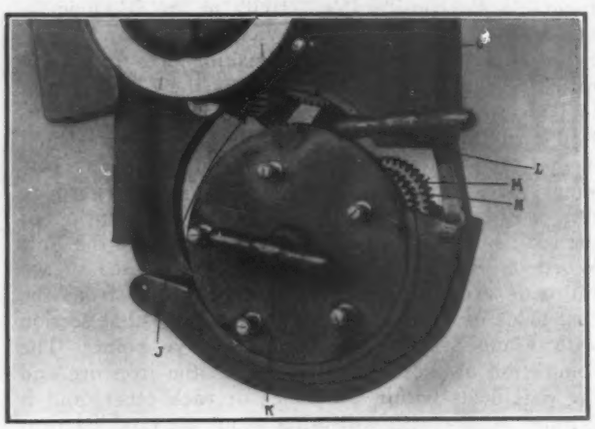


Fig. 9.—Detail of the Quick Change Gear Box.

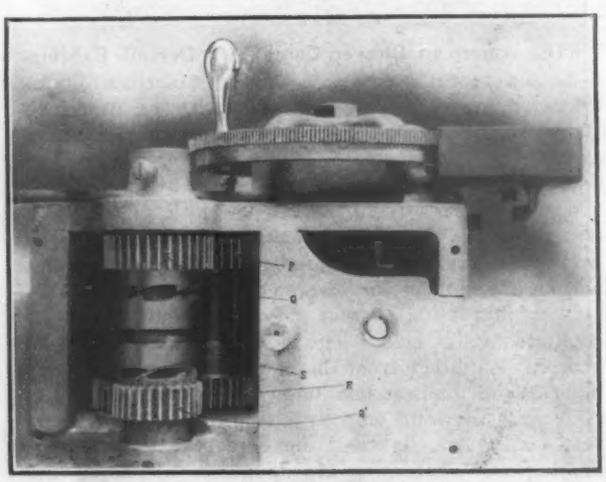


Fig. 10.—Detail of the Feed Reversing Mechanism.

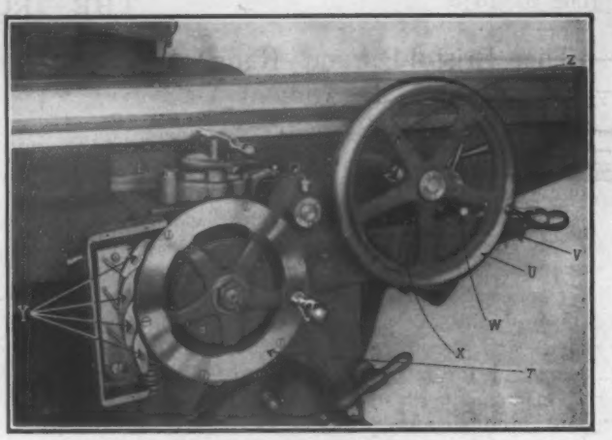


Fig. 11.—Detail of the Automatic Cross Feed.

is through gears H and I, and thence down through the body of the machine to the spur pinion J in the quick change gear box, Fig. 9. The handles K and L operate the quick change feed mechanism K, revolving the dial until the gear M can mesh with the spur pinion J and the gear N with gear O, handle L being used to mesh the gears by swinging the case closed.

Fig. 10 gives further details of the feed mechanism, showing the way in which the reverse in the direction of the travel of the table is obtained. Gears O mesh with gear P, P with Q, R with S and S with Q′. As the clutch is keyed to the shaft which operates the table travel, and gears Q and Q′ run free on this shaft, longitudinal table travel in both directions is obtained by the reversing clutch. By this unique arrangement five changes of travel to the table are obtained by the quick change gear box, and these are doubled at the back of the column by manipulating the pull pin E.

Further details of the machine, especially the arrangement of the automatic cross feed, are shown in Fig. 11. The handwheel T operates the cross feed and the handwheel U the longitudinal feed. When the four pawls Y are dropped in place in the ratchet on the handwheel T, the action of the lever V operates the cross feed. Four pawls are used to insure engagement with the ratchet teeth of the handwheel T. The adjustment of the cam at W controls the amount the ratchet is advanced by the pawls, or, in other words, the amount of the cross feed. At X is another pawl, secured to the lever V. When the table travel is automatically reversed, the sprocket Z reverses its direction, and through the pawl X, which engages with Z, the lever V is forced down, operating the cross feed automatically.

For this grinder a very simple countershaft has been designed, the drum of which adjusts itself automatically to different elevations of the table. It is self-contained and is easy to handle, from the fact that the bearings are held in line by a framework, which carries the drum. This framework also carries the bearings from the countershaft proper. The framework at its ends has ball joints, which rest in sockets in the hangers.

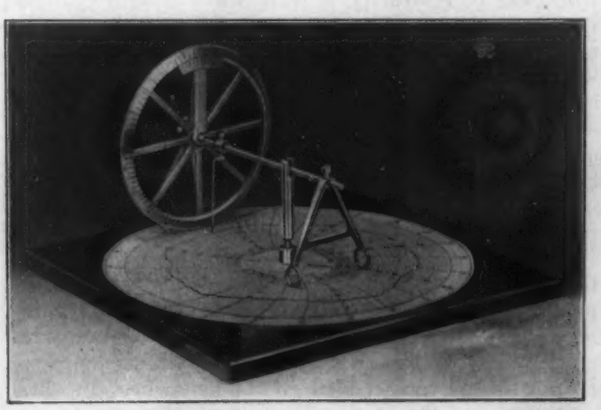
The Thompson universal grinding machine may be seen in operation at any of the demonstration shops of Hill, Clarke & Co., Inc., of Boston and Chicago, and their branch offices at New York, Philadelphia and Cleveland.

Fieser & Bentley, iron, steel and coke merchants, Columbus, Ohio, announce the incorporation of their business into a stock company, which will be known as the Fieser-Bentley-Warner Company, with headquarters in rooms 709-711 Wyandotte Building, their present quarters. Wm. Deshler Warner, son of R. S. Warner, formerly president of the Republic Iron & Steel Company and the King, Gilbert & Warner Company, has become actively associated with them, and will be secretary of the new company.

The Bristol-Durand Radii Averaging Instrument

For 20 years the Bristol Company, Waterbury, Conn., has specialized in manufacturing automatic recording instruments for pressure, temperature and electricity. As the class of recording instruments using circular charts has come into general use, there has developed a demand for a simple device to quickly determine the average of the record made on such charts, and the integral value for the whole period covered by the record. This need will be fulfilled by the instrument illustrated herewith, which is based upon a fundamental principle as worked out and patented by Prof. W. F. Durand of Stanford University and is constructed in accordance with a novel design recently patented by Wm. H. Bristol, president of the Bristol Company.

The instrument can be applied for averaging records of any kind on circular charts having uniform graduations, as, for instance, records of watts, amperes, temperature, pressure, &c. Recording instruments equipped with circular charts are therefore made available for a number of applications for which it was previously thought necessary to use instruments recording on straight lines or strip record charts. Recording differential pressure gauges are coming into use for measuring velocities and volumes of liquids, air or gas flowing in mains, and this integrating device will prove of value for quickly obtaining total volumes of flow for any given period of time.



The Bristol-Durand Instrument for Obtaining the Mean Radius of a Circular Chart Record, Made by the Bristol Company, Waterbury, Conn.

The instrument is of simple construction. A wooden base with a metal socket is provided for supporting and centering the chart. The socket holds a rotatable pin with a vertical slot at the top to receive the bar which carries the integrating tracer point and triangular support. The vertical groove in the rotatable pin allows the integrating wheel to roll on the chart with uniform pressure due to its own weight. The integrating wheel is 6 in. in diameter, and its rim is graduated into 100 divisions and fitted with a vernier, which makes it possible to easily read to tenths of divisions on the integrating wheel. The wheel is so large that it is not necessary to supply a counting device for the number of revolutions. The number of complete revolutions cannot be more than two, even for a record of maximum size on the 12-in. charts.

To operate the instrument the thumb and forefinger of one hand are applied to the base of the triangular support, which is moved radially, so as to cause the tracer point to continually follow the record curve, while the chart is turned with the other hand. By referring to a line plotted on a sheet of cross section paper furnished with the instrument, for the particular record curve that is to be measured, the total reading for the entire 24 hours, or other period, may be taken off directly.

An explanation of the theory upon which the operation of the instrument depends was given by Professor Durand in a paper presented at the New York meeting of the American Society of Mechanical Engineers in 1908. Briefly summarized, it is as follows:

In applying the instrument it is necessary to have a uniform radial scale, from which it follows that equal increments in the length of the radius correspond to equal increments in the watts, amperes, temperature, or whatever quantity is measured. The integrating wheel, being carried at right angles to the shaft passing through the center, does not turn and give a reading when the tracing point is moved on a straight radial line, but if the tracing point is made to follow a record the integrating wheel will revolve and the amount of the revolution will correspond to the total of the circumferential elemental components of the record curve, the radial elemental components of the record having no turning effect on the integrating wheel. As the lengths of the arcs of concentric circles for given angles or for the entire circumference are proportional to their radii, it is evident that the amount of turning of the integrating wheel, and the reading obtained thereon, will be proportional to the average radius of the record traced.

The instrument is adapted for integrating charts with either straight or curved radial time arcs. The correction necessary for curved radial time arcs may be made after completely tracing the record by returning the tracing point to a point on the chart having the same radius as the starting point, the movement of the tracing point being along an arc corresponding to the curved radial time arcs.

Railroad Building in the Llano Ore District of Texas.—AUSTIN, TEXAS, June 24.—The prospects are favorable for considerable activity in the development of the iron ore field in the vicinity of Llano. The Southern Pacific is said to be making preparations to haul large quantities of the ore from the Llano district to Galveston for shipment to Eastern works. Julius Kruttschnitt, Chicago, and officials of the Texas lines of that company, recently visited Llano and made a personal investigation of the situation with regard to this prospective traffic and the proposed extension of the road west from that point to connect with the Fort Worth & Rio Grande division of the Frisco. Two railroads are now being constructed south from the coal fields of Erath and other counties of that section with Llano as their southern objective point. The completion of these roads will place the iron ore and the coal fields within 150 miles of each other, and it is expected that this will bring about the establishment of iron works in the Llano district.

The American Blower Company's Detroit Exhibit.—At the recent convention of the American Foundrymen's Association at Detroit, Mich., the American Blower Company had, as a spectacular feature of its exhibit, an electric cupola blower holding a large inflated ball in suspension in a jet of air at an angle of about 50 degrees from the blower outlet. Attention was called to the fact that the company adapts the details of its blowers to standard motor specifications and arranges them for direct connection to either direct or alternating current motors without the use of countershafts or belts. The blower exhibited was sold and shipped direct from the exhibition to the Chicago plant of the Johnson Jennings Company of Ohio. The American Blower Company also exhibited generating sets for electric lighting, the Sirocco fan system of heating and ventilating for foundries or shops, disk ventilating fans and the Sirocco electric fan and air purifier for office and home use.

The Rochester Horizontal Boring Machine

A New Standard Tool for Horizontal Boring, Drilling, Tapping and Milling

Novel features are embodied in the floor type horizontal boring, drilling, tapping and milling machine, which will be marketed by a new organization, the Rochester Boring Machine Company, Rochester, N. Y. The machine shown in Figs. 1 and 2 is the No. 3 size. Two larger sizes are under construction and others will be added as the demand warrants. The No. 3 machine has a 3⅜-in. spindle, with a continuous traverse or feed of 36 in. The vertical adjustment of the saddle in the standard machine is 54 in., and the rated horizontal traverse of the column 6 ft., although it can be safely traversed over 7 ft. in the standard machine. The machine is of the type in which advantage is taken of the fact that it is easier to raise and lower a counterbalanced saddle of a relatively small constant weight than to adjust work of varying weight and dimensions to the tools. Heavy work that cannot easily be moved may be fixed in position and bored, drilled, tapped or milled at one setting in most cases, as the working adjustments are provided in the machine itself.

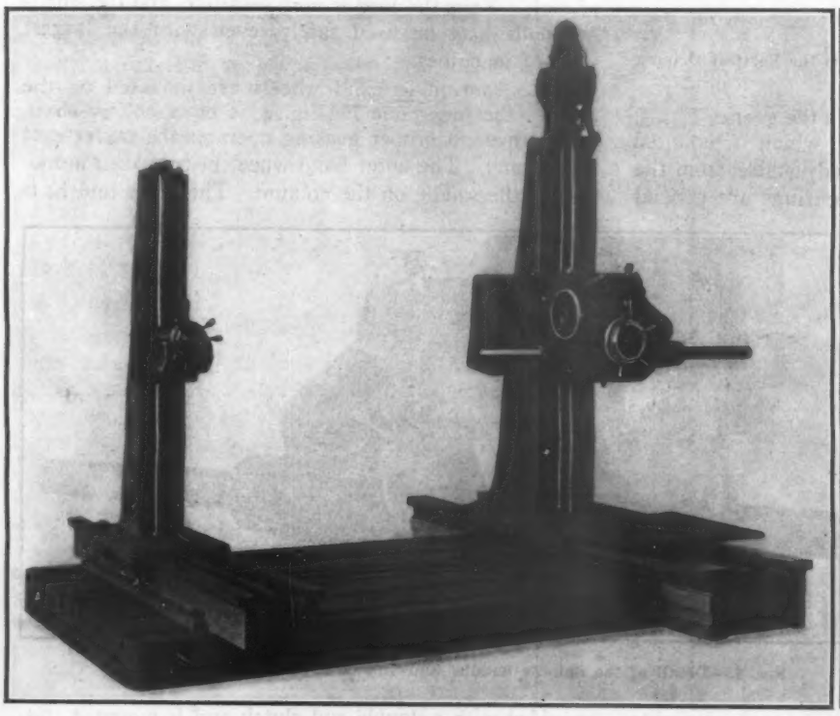


Fig. 1.

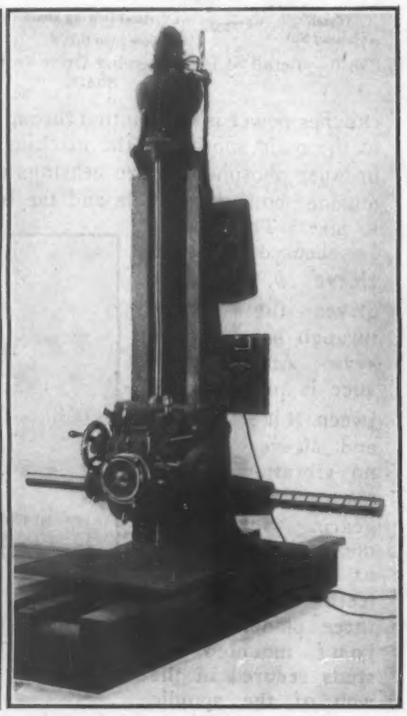


Fig. 2.

The No. 3 Horizontal Boring, Drilling, Tapping and Milling Machine Built by the Rochester Boring Machine Company, Rochester, N. Y.

An original feature is the arrangement by which any length of bar traverse can be obtained without resetting, by simply extending the spindle by manipulating a gear driven nut engaging a steep pitch thread cut in the spindle. This also gives a positive and uniform feed. The feed adjustment is so sensitive that even the smallest drills may be used without danger of breaking. All feeds may be operated either by hand or power, with fast or slow motion. All operations are controlled from the operator's platform on the base; all levers, hand wheels, clutches and adjustments are within easy reach and convenient to the work. Electric drive is employed, a motor being mounted on the top of the column. No strongbacks or counterbalances of the spindle are required. The spindle saddle is counterbalanced by a weight sliding on the back of the column. The machine is massive and powerful throughout, and its mechanical features are unusually simple for this type of machine tool.

The arrangement of the motor drive permits of a direct transmission which eliminates complications of gears and shafts, and has proved very efficient under the severe conditions in which the machine operates. Either vertical or horizontal motors may be used, but the vertical type are furnished regularly. A constant speed motor is used, of either direct or alternating current induction type, having for the No. 3 machine a capacity of 3 hp. and running at 1000 rev. per min., which gives ample power to drive a 12-in. milling cutter at 80 ft. or more cutting speed taking a heavy cut in cast iron. The power is transmitted from the vertical driving shaft, running at 750 rev. per min. to a driving mechanism which is entirely inclosed within the saddle. Secured to the shaft are friction clutches, shown in detail in Fig. 3, operated through a sliding collar by the lever A, Fig. 4, at the front of the saddle, which controls the starting, stopping and reversing of the driving mechanism. In the middle or neutral position the clutches are disengaged and the shaft runs idle; in the downward position the drive is forward and in the upper position the direction is reversed. The rheostat for starting and stopping the motor is at the right of the column, as may be seen in Fig. 2.

The driving power is transmitted from the vertical shaft to the change speed gears through the bevel gears connected with the loose members of the clutches, and a tumbler gear device operated by the speed lever B, Fig. 4, gives the five speed changes, the number being increased to 10 by back gearing controlled by the lever C. Thus the spindle may be run at speeds ranging by approximately geometrical progression from 15 to 200 rev. per min. From the intermediate shaft carrying the

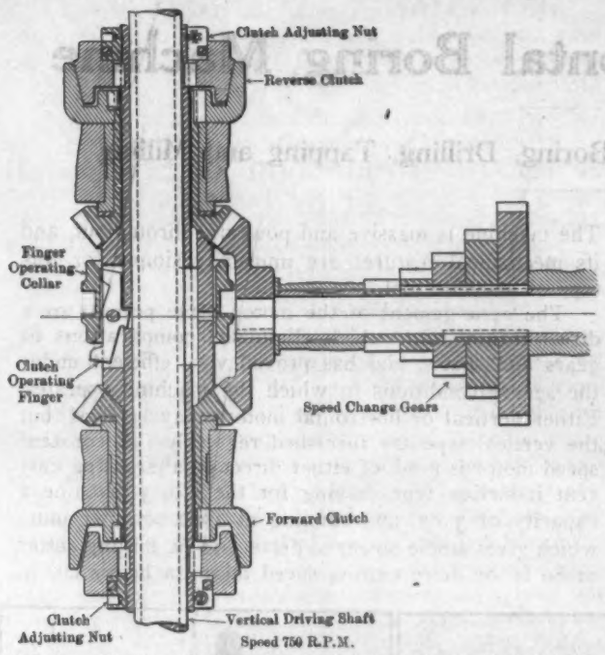


Fig. 3.—Detail of the Reversing Drive from the Vertical Driving Shaft.

clutches power is transmitted through the gear *a*, Fig. 5, to the main spindle of the machine, which is mounted in taper phosphor bronze bearings adjustable from the outside; both the spindle and the bearings are ground to size. The gear *a* is secured to the sleeve *b*, which drives the spindle through heavy spline keys. Ample clearance is provided between the spindle and sleeve, so that no vibration can be transmitted from the gearing to the spindle. The other end of the sleeve has teeth at *c* engaging three planetary pinions mounted on studs secured in the web of the spindle feed gear *d*. These pinions in turn mesh one side of the internal gear *e*, the other side of which engages pinions *f*, which transmit motion to the spindle feed nut *g*. The nut has a very large flange which rotates between large ball thrust bearings with ¾-in. steel balls and takes the end thrust from the bar in either direction. When the feed is disengaged the nut is rotated at the same speed as the spindle, which remains in a fixed position. Through the planetary gear system in combination with the feed gearing a differential rotation can be given the nut, advancing or retarding it. The traverse of the spindle is affected proportionately, and the spindle is moved in either direction. The driving pinions of the system are given orbital movement through the gear *d* from the feed change gears *h*, which are selectively engaged by a diving key manipulated by the lever I, Fig. 4. With the back gears these gears give eight feeds in geometric ratio from 0.01 to 0.25 in. The back gears are controlled by the lever J. The feed is reversed by meshing alternately the driving pinion and an intermediate gear. A gear transmits the motion to the feed change gears, which in turn drive the shaft carrying the hand feed wheel D. A friction clutch operated by a clamping nut G on the outside of the hand wheel serves to engage the power feed, which may be adjusted so as to yield at a definite point to prevent breaking of tools. Thus the feed is very sensitive, and the smallest drills may be used safely, even with the largest sizes of machines.

Two concentric hand wheels are mounted on the saddle; the inner one E, Fig. 4, is on a hollow shaft, which through proper gearing operates the traverse of the column. The outer hand wheel F, controls the motion of the saddle on the column. The inner one E, is provided with a double end clutch and is mounted slidably on the hollow shaft. Pulling the wheel outward engages a clutch on the outer hand wheel F, and power drive is engaged to the inside shaft, transmitting the motion to a rotating nut on the elevating screw which controls the saddle. In its inner position the hand wheel E engages a clutch fixed on the hollow shaft, and the vertical shaft for traversing the column is

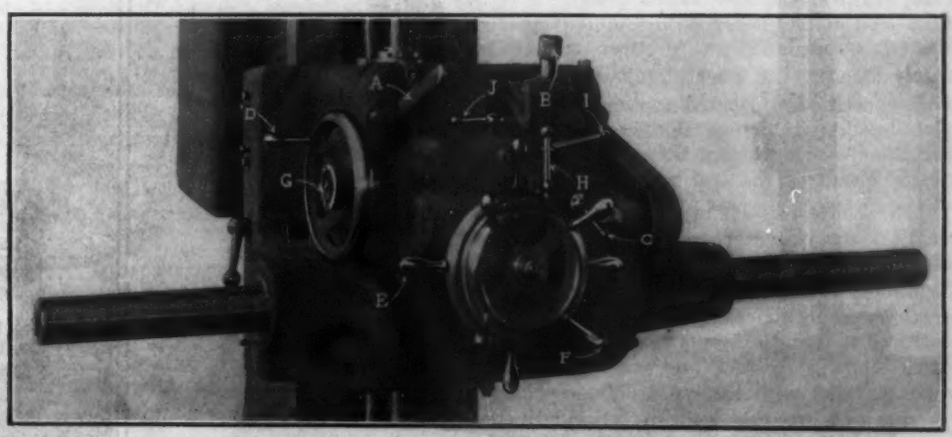
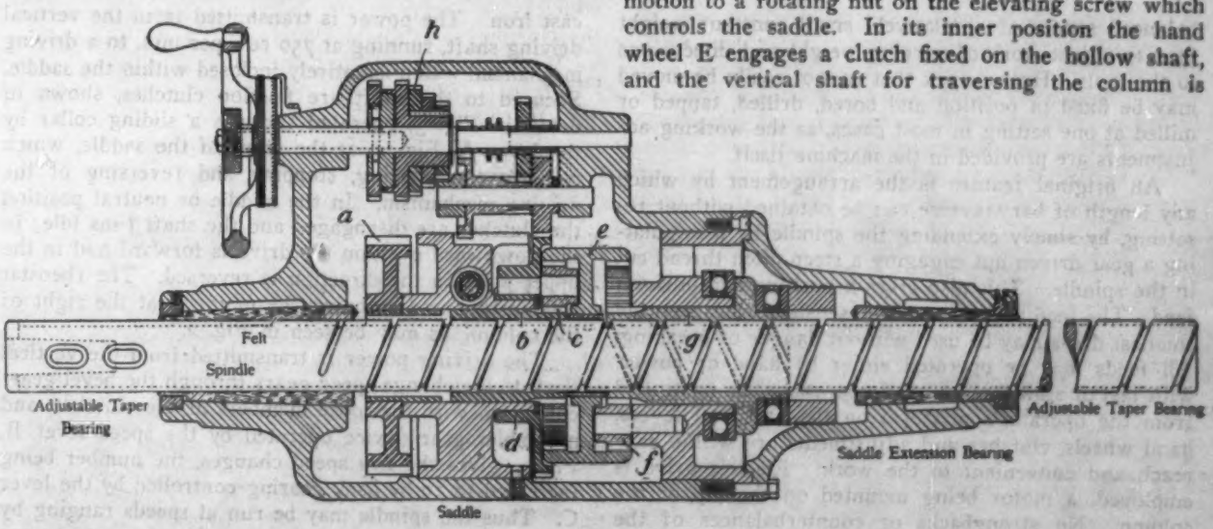


Fig. 4.—Detail of the Spindle Saddle, Showing Controlling Means.



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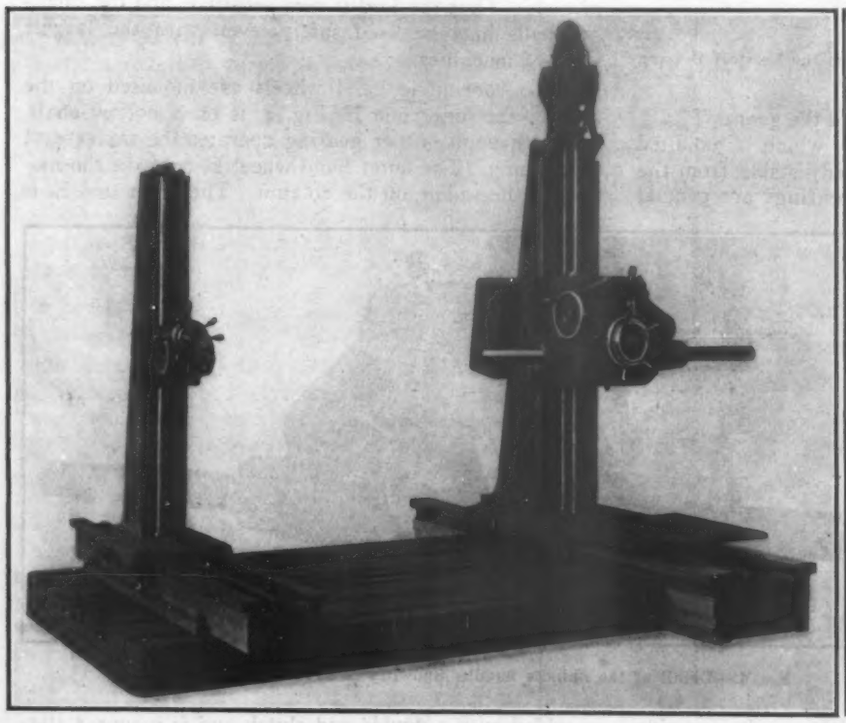

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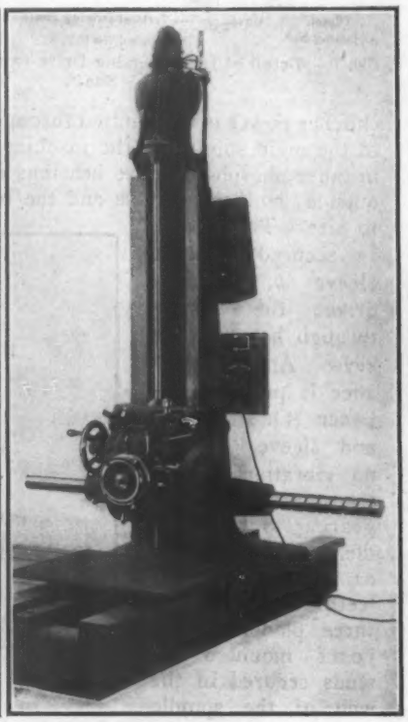

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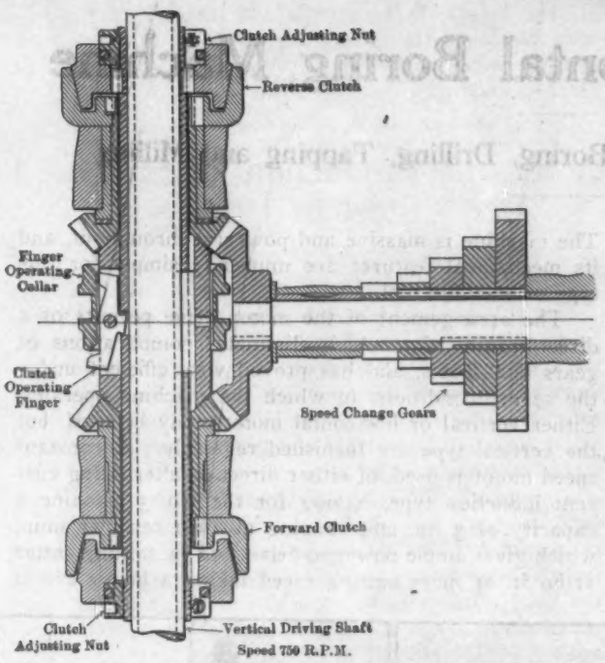

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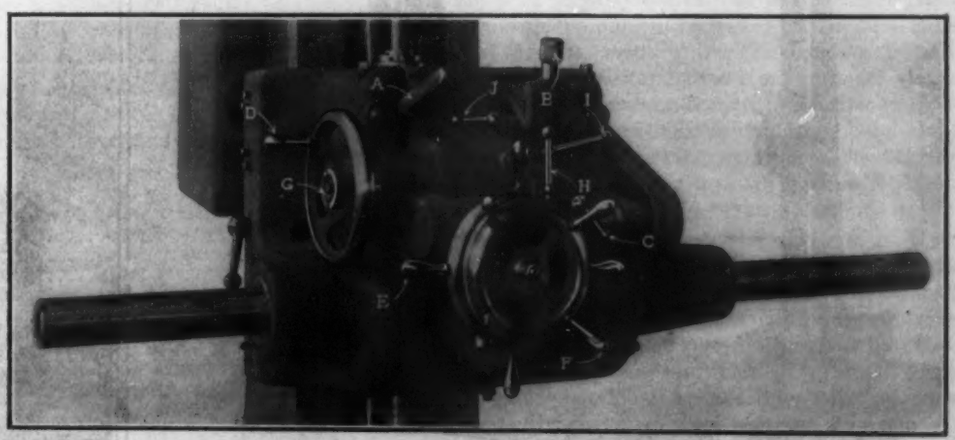

Fig. 4.—Detail of the Spindle Saddle, Showing Controlling Means.

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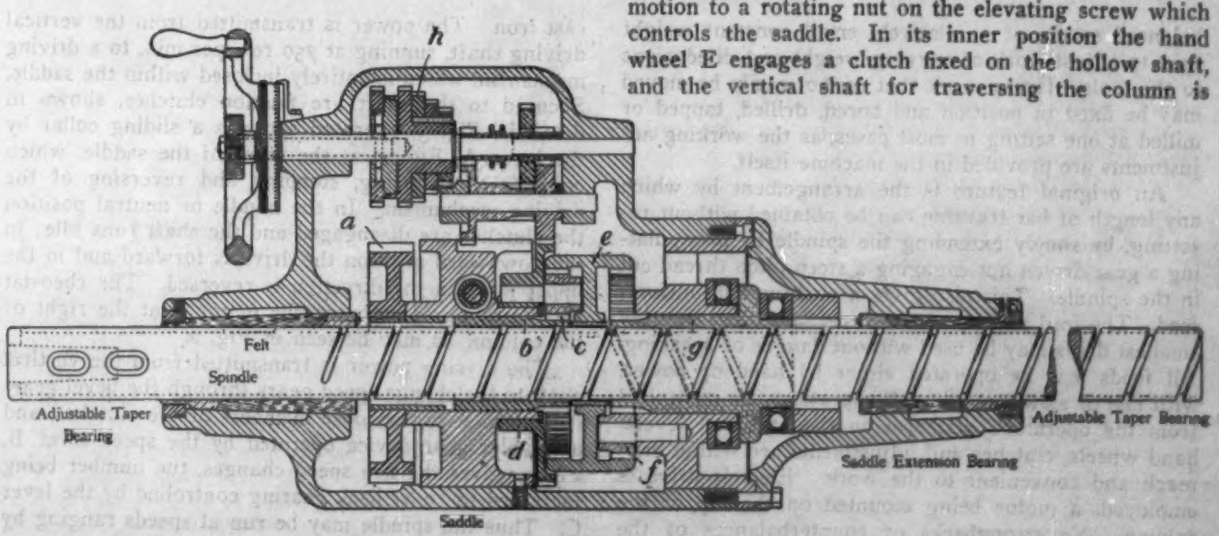


Fig. 5.—Detail of the Spindle Drive and Feed.

driven. These mechanisms engage with the feed box without the back gears, affording four feed changes in either direction for traversing the saddle and the column when milling.

The shaft carrying the worm that actuates the traverse has a clutch on the outside by which direct high speed constant gearing can be engaged, giving a rapid traverse for the saddle and column and spindle of 6½ ft. per minute. The shaft, slidably mounted, can engage either the feed gears, the rapid traverse gearing, or be entirely disengaged. The lever H controlling this shaft when thrown to the left engages the feed gears; in its middle or neutral position the shaft is not driven; when thrown to the right the rapid traverse is engaged. The vertical shaft for traversing the column transmits the motion by a pinion meshing in a rack in the base slide.

The materials for the various parts of the machine have been carefully selected. All gears are of either nickel chrome steel, cast steel or manganese bronze. Ball thrust collars and lock ruts for securing proper adjustment, and phosphor bronze bushings are employed. The column is a heavy casting, with a long wide base designed for great rigidity. For the saddle and column traverse one side rail only is used in guiding, giving lateral surfaces close together to assure accuracy and overcome cramping tendencies. The column can be traveled by hand by the handwheel F, Fig. 4, or by power in either direction with power feed changes for milling, together with rapid power feed, or the column may be clamped in a fixed position. The slide base, furnished in any desired length, is heavy and of deep section, and is braced throughout its length by box ties. It is furnished with grooves on the side for accurately locating the floor plate, which is of heavy box type construction, planed top and bottom. The floor plate has longitudinal T slots and is rigidly attached to the slide base by heavy bolts. The latter may be attached either on the end or the side of the floor plate.

The outboard bearing is made with the same vertical and horizontal traverse as the main column, and is adapted for supporting long boring bars in suitable bushings. The bearing is traversed by hand wheels arranged concentrically similarly as on the saddle, but operated by hand only. The outboard support is traversed laterally by rack and pinion and remains at all times parallel with the main column, being guided by tongues and grooves, insuring quick adjustment to the working position. Both columns have solid wedge gibs and clamping devices for locking in desired position. The construction of the gibs gives a solid contact and very accurate adjustment. Graduated scales with vernier or micrometer readings are provided for the column and base slide, as well as the outboard support and slide. This has proved a great convenience for quickly adjusting the machine in position and spacing known distances of work. A micrometer reading is provided on the spindle feed hand wheel D, Fig. 4, with the aid of which the spindle can be adjusted to 0.001 in. This micrometer reading is useful in gauging depths in boring, drilling and milling.

The specifications of standard No. 3, No. 4 and No. 5 machines are as follows:

Number of machine	3	4	5
Spindle diameter, inches	3⅜	4½	5½
Spindle traverse, longitudinal, inches	36	48	60
Spindle speed, revolutions per minute	15 to 200	6 to 120	2½ to 100
Number of speeds for spindle	10	12	16
Number of feeds for boring	8	10	12
Number of feeds for milling	4	5	6
Boring feeds per revolution spindle per minute, inches	0.01 to 0.25	0.01 to 0.5	⅛ to 5
Milling feeds per revolution spindle per minute, inches	0.04 to 0.152	0.04 to 0.304	⅛ to 5
Taper bore in spindle, one end, Morse	5	6	7
Saddle, vertical traverse, inches	54	60	72
Column, horizontal traverse, in.	72	84	96
Size of floor plate, feet	6 x 9	7 x 10	8 x 12
Size of motor recommended, horsepower	3	5	10
Net weight complete, pounds	19,000	29,500	58,000

The length of the spindle, the traverse of the column and the saddle, the dimensions of the floor plate and the speed range of the spindle will be varied to meet special work or conditions.

A Record Production of Structural Steel in 1909

The statistics just published by General Manager James M. Swank of the American Iron and Steel Association show that the production of structural shapes in the United States in 1909 was 2,275,562 gross tons, or more than double the total for 1908. Low prices for fabrication last year and the low level to which mill prices also fell stimulated construction, so that a new record was made. The greatest output previous to 1909 was in 1906. The statistics embrace beams, beam girders, zee bars, tees, channels, angles and other structural forms, but they do not include plates, girders made from plates, or bars for reinforcing concrete work. Of the total production in 1909 about 2,230,748 tons was rolled from steel and about 44,814 tons from iron, against about 1,080,758 tons rolled from steel and about 2423 tons rolled from iron in 1908. The production in 1908 and 1909 by States was as follows in gross tons:

	1908.	1909.
New York and New Jersey	86,044	177,483
Pennsylvania	810,146	1,642,074
Tennessee, Alabama and Ohio	31,287	60,213
Indiana, Illinois, Wisconsin and California	155,704	395,792
Totals	1,083,181	2,275,562

The following table gives the production of structural shapes from 1892 to 1909. Prior to 1892 structural shapes were not separated from other rolled products in the statistics:

	Gross tons.		Gross tons.		Gross tons.
1892	453,957	1898	702,197	1904	949,146
1893	387,307	1899	850,376	1905	1,660,519
1894	360,305	1900	815,161	1906	2,118,772
1895	517,920	1901	1,013,150	1907	1,940,352
1896	495,571	1902	1,300,326	1908	1,083,181
1897	583,790	1903	1,095,813	1909	2,275,562

The Edgar Allen American Manganese Steel Company.—This company, whose office is in the McCormick Building, Chicago, has taken over the Chicago Heights plant of the American Brake Shoe & Foundry Company, devoted to the manufacture of manganese steel castings of all kinds, and has improvements under way which will more than double its capacity. The same company recently acquired the steel casting foundry of the Tropenas Steel Company at Newcastle, Del., which is also being greatly enlarged. The directors of the company are Rudolph Ortmann, J. B. Terbell, J. C. Ward, J. G. Gallagher and Otis H. Cutler. Mr. Ortmann is president and Mr. Terbell vice-president. Mr. Ward is also a director of Edgar Allen & Co., Ltd., Imperial Steel Works, Sheffield, England, and is at present in charge of its Chicago and New York branches.

Articles of incorporation have been filed by the Dominion Stamping Company, Ltd., Walkerville, Ont., Canada, with an authorized capital stock of $100,000, of which $60,000 has been paid in. It is the intention of the company to purchase a tract of land in Walkerville and erect a building to manufacture general automobile stampings, including hoods, tanks and fenders, and also a line of stove parts. The principal stockholders are Henry P. Cope, John H. French, George S. French, Fred J. Armstrong, Peter B. Luyster and Walter F. Tant, all of Detroit, and Charles J. and Albert Montreuil of Walkerville.

The Carbo Process for Open Hearth Steel

A modification of the usual practice at open hearth steel furnaces has been developed by Louis M. Atha, Newark, N. J., with a view to greatly reducing the percentage of pig iron used or entirely eliminating pig iron. Its application is naturally most advantageous in localities remote from blast furnaces or those in which scrap can be bought at a considerably less price than pig iron. The essential feature of the process is the introduction of "carbo" into the furnace, its use resulting in a saving in cost, while the quality of steel is equal to that produced when there is a large percentage of pig iron in the charge. In his patent specification Mr. Atha says:

> The ordinary process of making steel from a mixture of pig iron, steel and iron scrap in a basic open hearth furnace is expensive in certain localities owing to the high price of pig and also to the large amount of limestone necessary to add to the charge to eliminate the phosphorus. The pig iron and cast iron are used in order to obtain a sufficient amount of carbon to melt down the steel. Some attempts have been made to introduce sufficient carbon to the charge without using pig iron or cast iron. This has been done by adding the carbon in the form of ordinary coke, charcoal or anthracite in pulverized form, but it has not proved satisfactory as the greater portion of the carbon so introduced is carried off with the vapors, or otherwise, during the melting down process and before the carbon can be taken up or absorbed by the metal. After much experimenting I have discovered that if carbon of a certain character is used during the melting down of the charge, substantially all of such carbon will be absorbed during the melting down and a high grade steel produced.
>
> I use carbon in the form of what is known as oil retort carbon. This carbon is preferably pulverized before it is added to the charge. This grade of carbon is very hard and will remain in the charge during the melting down for a much longer time than other carbon. It is therefore absorbed and not carried off by the vapors. In carrying out my process I introduce in an open hearth furnace limestone or other suitable flux; then the steel and iron scrap and then the pulverized carbon, and on top of this the pig or cast iron. The whole is melted or boiled down and the product is a fine grade of steel.
>
> In some instances I may put the carbon in the furnace first, in which case during the process of melting down the carbon has to pass through the melted charge, and before it has an opportunity to escape or pass off with the vapors it is absorbed by the melted metal.

"Carbo" is about 99 per cent. pure carbon and this is in such chemical form that it is extremely slow burning. For this reason it can be charged in the furnace along with the scrap and will remain without burning until the charge is melted and has a chance to take up the carbon. Thus it is found that the first test taken from the bath shows a sufficiently high carbon to be melted down in the regular way. In the basic open hearth furnace the lime charge can be reduced when carbo is used; it is stated that the value of the lime saved will just about pay for the carbo. This reduction in lime allows the heat to be worked a little faster, which in turn reduces the fuel cost per ton and permits of an increase in the weekly production of a furnace.

This process has been in continual use for the past year and a half at the works of the Titan Steel Casting Company in Newark, of which Mr. Atha is superintendent. The results have been quite satisfactory. The table below shows the make-up of a charge before carbo was used and also the present make-up of a charge with the use of carbo:

	Without Carbo. Pounds.	With Carbo. Pounds.
Pig iron	22,000	0
Steel scrap	30,000	43,000
Cast iron scrap	0	8,000
Carbo	0	1,100
Metallic charge	52,000	52,100
Limestone	9,000	7,000
Totals	61,000	59,100

In computing the saving made by the use of carbo comparison is made of the cost of scrap with that of pig iron. The spread between the two differs in different localities. In eastern Pennsylvania, for example, the difference between the market price of the best melting scrap and that of basic pig iron has ranged this year from $1.25 to $2. In Western markets the difference is commonly greater. Where light scrap is substituted for heavy melting steel the cost is reduced still more. The Debevoise-Anderson Company, 95 Liberty street, New York, has been appointed sole agent for the sale of carbo for use in the production of open hearth steel.

Government Investigation of the Iron Industry

Conditions of employment prevailing in the iron and steel industries in the United States, with the details concerning wages paid, the hours of labor a day and the number of days labor a week, are to be made the subject of immediate investigation by the Department of Commerce and Labor through the labor bureau as the result of the adoption by the United States Senate on June 23 of a resolution offered by Senator Borah of Idaho.

Strenuous efforts were made last week by Samuel Gompers and other labor union leaders to have the House pass the Stanley resolution calling for the investigation of the United States Steel Corporation, particularly with reference to the financial panics of 1903 and 1907. Chairman Dalzell of the House Committee on Rules announced that the committee had adjourned for the present session of Congress and would not consider the Stanley resolution.

At Washington, Lloyd W. Bowers, Acting Attorney-General, sent to the Speaker of the House last week an answer to a resolution calling upon the Department of Justice for any information in its possession tending to show a combination between steel and other interests in violation of the Sherman antitrust act, or an effort to injure competition in the iron and steel industry, to increase working hours or to reduce wages. Mr. Bowers says that it is considered that a report at this time, such as the resolution contemplates, would be manifestly incompatible with the public interest, and should be withheld in accordance with the terms of the resolution itself.

A Pro-Boycott "Rider" Defeated

At attempt was made at Washington June 23 by various labor leaders to have the sundry civil bill amended by restricting the Department of Justice in the use of funds appropriated for antitrust prosecutions. When the sundry civil bill was before the House that body tacked on to it an amendment by Mr. Hughes of New Jersey providing that no part of the appropriation for the enforcement of the antitrust laws "shall be spent in the prosecution of any organization or individual for entering into any combination or agreement having in view the increasing of wages, shortening of hours or bettering the condition of labor, or for any act done in furtherance thereof not in itself unlawful." The Senate struck out the amendment and the House instructed its conferrees to stand firmly by it. Later the House, by the close vote of 138 to 130, decided to concur in the Senate amendment striking out the Hughes provision.

President Taft was brought into the controversy, telegrams being sent to the White House by various labor unions. In replying to one sent from the convention of the Brotherhood of Locomotive Firemen and Enginemen at St. Paul, the President said of the Hughes amendment: "The Supreme Court has decided that a boycott is a violation of the Sherman antitrust law and this proposal is an attempt to withhold the means of prosecuting that law when it is violated by a particular class thus to be made privileged. I am entirely opposed to such class legislation."

A High Speed Hydraulic Forging Press

The Type Built by the United Engineering & Foundry Company

The high speed forging press has been developed abroad and used extensively in England and Germany for about 10 years. In this country up to a year ago it was employed by only a few of the large companies making the heavier class of forgings. The machines shown in the accompanying illustrations show the progress made by Davy Brothers, Ltd., Sheffield, England, designers and builders first of steam hammers and later of hydraulic forging presses. In the earlier presses built by this company the water pressure was derived from a pump which was necessarily slow with the disadvantage that the water must pass through valves at high pressure and relatively long lines with many joints and the drawbacks of a large water system, such as the cutting of the plungers and packings by grit and the damage by water hammer. The United Engineering & Foundry Company, Farmers Bank Building, Pittsburgh, Pa., acquired the right to manufacture this machine for the United States, Canada and Mexico about a year ago, and has the complete drawings, patterns, jigs, fixtures, &c., for all sizes of these machines. Two of the earlier machines built were illustrated and described in *The Iron Age*, April 15, 1909, but the machine shown in Fig. 1 represents the very latest development in forging machines for large work, and Fig. 2 is the same machine, but built with an overhanging frame, which is considered better for smaller pieces.

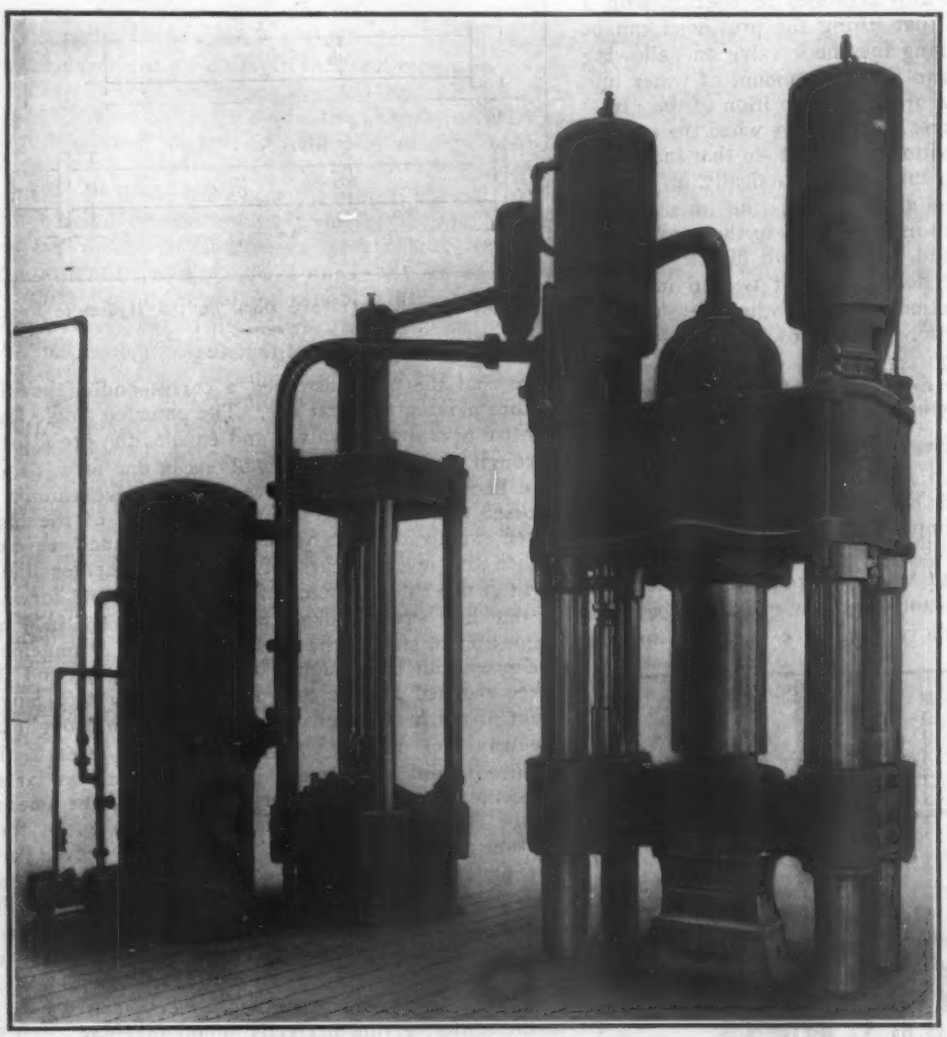


Fig. 1.—A Hydraulic Forging Press with Four-Column Frame, Built by the United Engineering & Foundry Company, Pittsburgh, Pa.

The next step after the direct pump driven press was the hydraulic intensifier, which made it possible to increase the pressure from less than 2000 lb. per square inch to between 4000 and 6000 lb. This makes the main press cylinders and the volume of water correspondingly small, which is a great advantage, as a large power press thus becomes of practical dimensions and the volume of water under this high pressure is relatively small and is not being handled through valves, being only under high pressure at the instant of delivering the squeeze. This was a long step forward, but a pump was still required and the system generally included a large accumulator as well, and was operated by a number of valves and levers. This press was slow, partly because of the number of valves and partly because of the low speed of the hydraulic intensifier. This intensifier, owing to the large volume of low pressure water which must be handled at low speed, was superseded by the steam intensifier which delivered the water at the high pressure required without the use of the pump and at a high rate of speed. The power equipment consists of two pistons directly connected together with a ratio of about 40 to 1, and when this device is set vertically with the water cylinder on top, the return stroke is by gravity, so that steam is used on one side only. The high pressure cylinder can be directly connected to the main cylinder of the press without the water passing through valves and the presshead moves at the same time as the intensifier ram in the ratio of 1 to 12. Thus if the travel of the intensifier is controlled a corresponding control of the presshead is obtained with the advantage of great exactness. A quick working stroke is secured, but it is also necessary to return the presshead quickly. This was accomplished by placing the steam cylinders on top of the machine and using the steam on one side of the piston only. These cylinders are so arranged that when forging is being done they do not consume any steam, and it simply flows back and forth in the main pipe.

Unless the proportions of the intensifier are large the stroke of the press will be short. An intensifier of sufficient capacity to give a practical forging stroke, and also the proper amount of clearance for a diversified line of forgings, would be impractical, owing to its size and the enormous amount of steam required to

operate it. To overcome this difficulty the presshead was lowered by the steam balance cylinders until it was nearly in contact with the forging. It then became necessary to have more or less water in the high-pressure system, according to the thickness of forging being operated upon which fixed the position of the main ram in its cylinder. This was accomplished by having a tank half filled with water and the balance with air at about 30 lb. pressure connected with this high-pressure system, and controlled by a check valve. When the presshead is lowered by wholly or partially exhausting the steam from the balance cylinders, the check valve automatically opens, allowing the required amount of water to flow from the tank into the system. This check valve is also arranged to operate with a lever connection, so that lifting the presshead can be accomplished by opening the check valve and allowing the balance cylinders to force an amount of water into the tank that will give the proper position of the presshead. This action takes place always when the intensifier is in its lower position, or at rest, so that the presshead can be lowered until it is practically in contact with the forging, and the steam in the intensifier is used only for a stroke in proportion to the amount the forging is reduced, and in an amount directly in proportion to the work done. This it is said makes a press efficient in action, as once the presshead is brought down on the forging this low position is maintained until the forging is finished, using no more steam in the balance cylinders, as this is forced back and forth from the cylinders to the main steam pipe.

The Single Lever Control

This produced a satisfactory press so far as a single stroke was concerned, but when rapid action was required it was found impracticable to operate a number of valves or levers, as, if one was moved out of its proper time, the result was disastrous to the machine or the work, and it meant very slow operation, because it was necessary to move one valve or lever, and be

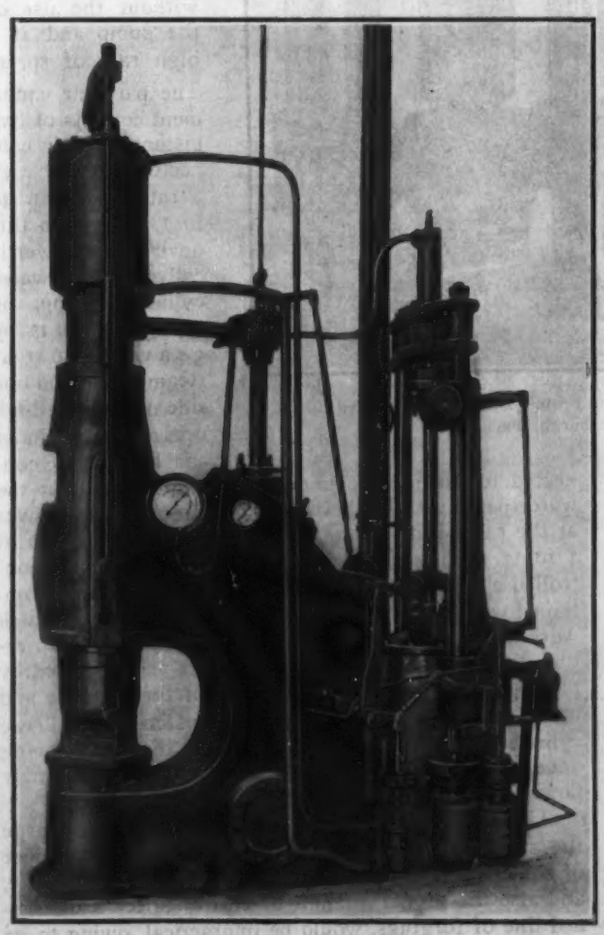


Fig. 2.—A Self-Contained Type of Press with C Frame for Lighter Work.

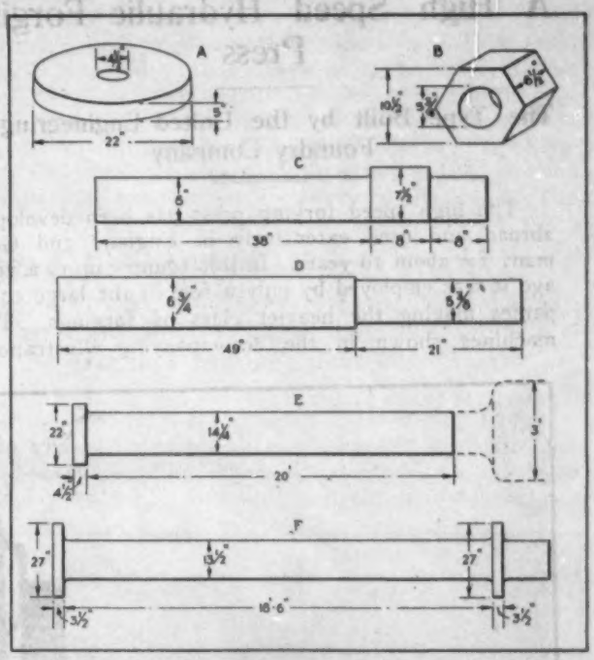


Fig. 3.—Examples of Work Done on the Hydraulic Forging Presses.

sure that the press assumed a corresponding position before moving the next one. The patented single lever control operates all valves and enables the press to go through an entire cycle of motions in one forward and one back motion of the lever. The valve cannot be crossed and the press follows the stroke of the hand lever exactly, both as to speed and distance traveled. When the lever is back of the vertical center line a light stroke of from 2 to 6 ft. is obtained, and forward of that line a power stroke of from 2½ to 6½ in. long, according to size of the press. With this arrangement the press can be brought down on a forging and the piece reduced from 2 to 6 in. by one forward movement of the hand lever. The press can be brought all the way back or part way by moving the lever to the required position, or it can be brought back as far as the center line, which returns the presshead the amount of the forging stroke. This forging stroke can then be repeated as often as the lever can be moved, and in practice this is as high as 150 per min. on the small presses and 60 on the large ones. This stroke, while it is repeated as often as the blow of a steam hammer, is at a much lower velocity, as the press moves inches where the hammer moves feet. This slow action is said to be beneficial to the metal, because it works it to the center, giving perfectly sound forgings. This is also advantageous when shaping tools or cutters are used, as they can be set up and the presshead brought down on them and then sighted for position before the pressure is applied. The machine does not require much foundation, and in working there is no vibration transmitted to surrounding buildings, as all strains due to working are taken up in the machine itself.

The machines built by the United Enginering & Foundry Company follow the general design of the English machines, but certain refinements of design have been made. The main rams are of chilled cast iron and are ground to fit the steel cylinders, which are lapped and bored to receive them. Hard alloyed steel is employed in the construction of the intensifier ram, which is ground to size. The joint pins and bushings are all hardened and lapped. Nearly all the parts of the press are steel. All the packings can be renewed without dismantling any part of the press or employing any power outside of the machine itself.

A number of these presses have already been built and are turning out a diversified line of forgings. Some examples of their output are shown in Fig. 3. A is a disk which was upset from a piece of stock 14 in. square

and punched in 19 min. by a 500-ton press. This same press made and punched the nut B in 18 min. A 150-ton press forged the eccentric shaft C from an 8-in. square billet in 13 min., and the shaft D was made in a minute less by a 300-ton press from a piece of 7 x 7 in. stock. The other two larger shafts, E and F, were made in a 1500 and a 2000 ton press, in one and two hours, respectively.

The Elmore Quick Change Drill Press

A More Powerful Sensitive Drill, Made by the Dwight Slate Machine Company

A new type of belted transmission between the driving pulley and the spindle is the principal feature of novelty in the Elmore quick change drill press made by the Dwight Slate Machine Company, Hartford, Conn.

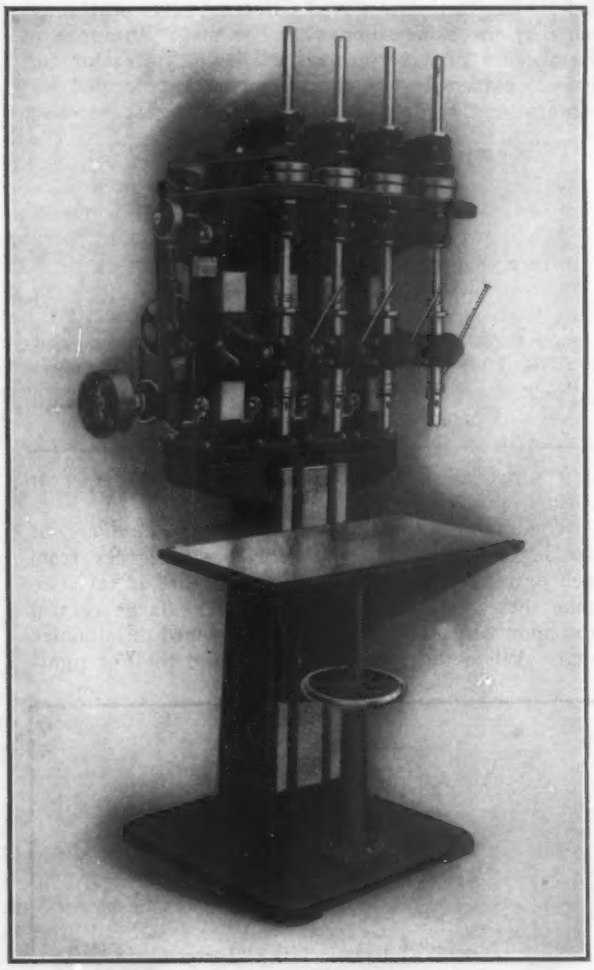


Fig. 1.—The No. 4 Elmore Quick Change Drill Press Made by the Dwight Slate Machine Company, Hartford, Conn.

It is also notable, however, for its more rigid and substantial nature, making it capable of using high speed steel drills, for the convenience and facility with which it may be operated and the relatively small amount of floor space occupied. With the new drive the several changes of speed are obtained instantly with the machine running and without the operator changing his position or shifting the belt either on cones or in tension. Fig. 1 shows a four-spindle type of the drill, the No. 4 machine, Fig. 2, detail front and side views of a one-spindle pattern, and Fig. 3 a top view which further shows the arrangement of the single continuous driving belt.

Four different speeds are available, 500, 800, 1280 and 2050 rev. per min., by the manipulation of friction clutches interposed between pulleys of different diameters mounted operatively with respect to both the spindle and the driving shaft. Cone clutches are used with extremely large wearing surfaces compared to the duty required of them, and the face angle is one which experience has shown to give a good grip without danger of sticking. On the left side of the top column are two levers, which control the movements of the clutches and are self-locking in all positions; the lower one also controls the starting and stopping. Each spindle of a multi-spindle drill can be started, stopped or have its speed changed independently of the others. The changes may be made either with the machine running or still. Having friction clutches providing the means of stopping and starting and changing speeds eliminates the necessity of tight and loose pulleys and a cone driving pulley. A single driving pulley takes the place of both. These new presses have power sufficient to drive a 29-32-in. high speed drill to its full capacity.

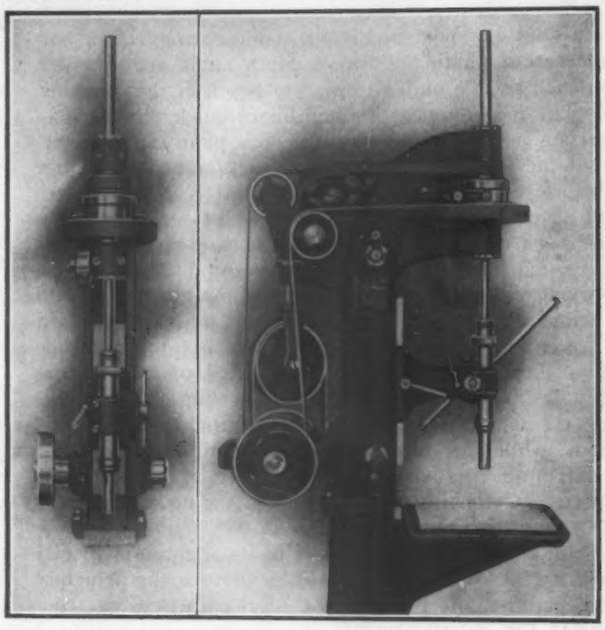


Fig. 2.—Front and Side Views of the Upper Part of a Single-Spindle Elmore Drill.

The spindles are bored with No. 2 Morse taper holes and are mounted in ball bearings to avoid the need of frequent oiling and reduce the friction as much as possible. The cones and raceways of the ball bearings are hardened and ground and are of special design for this type of drill.

The connection from the pulleys on the driving shaft to the pulleys on the spindle is by one endless belt 1¼ in. wide by 17 ft. long, which is never shifted to effect speed changes. The pulleys on both the driving shaft and the spindle are mounted on stationary hollow quills which relieve the spindle and driving shaft from belt stress. Proper tension of the belt is maintained by adjusting a knurled nut which raises or lowers the idler yoke. The spindles are balanced by flat coiled springs in the sliding head. Adjustment can be made to exactly counterbalance them or to automatically return them to the upper position. The use of this spring also imparts a more sensitive and even feed, it is claimed, than the chain and weight usually employed. The feeding lever has an adjustment for varying degrees of leverage, and is automatically re-

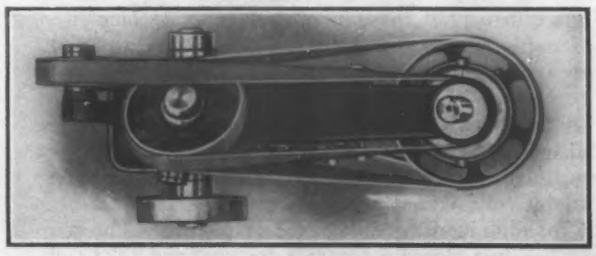


Fig. 3.—Top View of the Belt Drive.

tained in any position by the same spring which balances the spindle. Positive depth stops are mounted on each spindle quill within easy reach of the operator.

The top columns of the Elmore quick change drill presses are constructed on the unit plan and are self-contained. This form of construction permits either the use of a continuous driving shaft connected with the several spindles of a multi-spindle type, thus giving the same ratio of four speed changes in each, or if desired independent driving shafts and pulleys can be provided for each spindle, which, when connected with various sizes of pulleys on the line shaft, produces a different ratio of four speeds for each spindle. Thus in a three-spindle machine the speed of two of the spindles may be controlled by one driving shaft providing the same ratio of proper speeds for drilling operations, while the third spindle is controlled by an independent driving shaft driven at the proper ratio of speeds for tapping, counterboring, facing and similar operations. This feature makes the multiple-spindle machine particularly universal in its adaptation to different kinds of work. The following are the principal dimensions and specifications of machines with from one to six spindles:

Number of spindles	1	2	3	4	5	6
Distance between spindle centers, inches	..	9	9	9	9	9
Center of spindle to face of post, inches	8	8	8	8	8	8
Traverse of rack quill in head, inches	5½	5½	5½	5½	5½	5½
Traverse of head on post, inches	8½	8½	8½	8½	8½	8½
Total traverse of spindle, inches	13	13	13	13	13	13
Maximum distance table to spindle, inches	32	26	26	26	26	26
Diameter of spindle in bearing, inches	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16
Diameter of spindle nose, inches	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Hole in spindle, Morse taper	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Size of table, inches	15 x 18½	16 x 27½	16¾ x 36½	16¾ x 45½	16¾ x 54½	16¾ x 63½
Hight to top of frame, inches	73	73	73	73	73	73
Projected floor space, inches	20 x 33	27½ x 34	34 x 36½	34 x 45½	34 x 54½	34 x 63½
Approximate net weight, pounds	500	850	1,190	1,520	1,850	2,150

The especially small amount of floor space required by the different machines is noteworthy. The extreme distance from the front to the back of these machines is only 33 in., and since the operator does not have to make adjustments in the rear of the machine, the machines can be set up in rows back to back, effecting a material economy of floor space, which is important in large installations. The spindles are all of high carbon steel and all shafts, bearings, &c., are ground to size. The belts are endless and of a special tannage, and the steel balls are of imported high duty quality. The multiple-spindle drills are equipped with a table raising device.

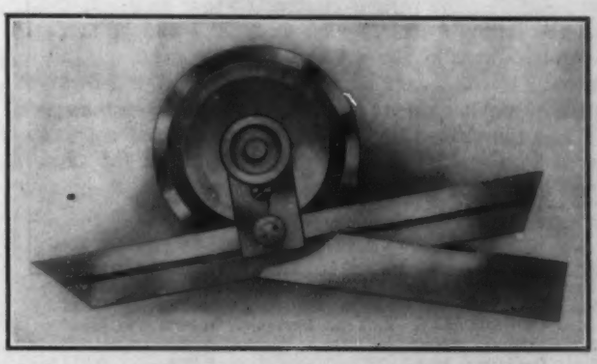
Freight Rate Advances Filed.—Washington advices state that the railroads in the central freight territory—Ohio, Indiana and Illinois—continue to file with the Interstate Commerce Commission schedules of advances in freight class rates, effective August 1. The average has not been compiled by the commission as yet, as the schedules are very bulky and numerous. One hundred and fifty roads in the Central Traffic Association, embracing territory south from the lakes to the Ohio River, west to Chicago and east to the seaboard, will, on August 1, advance all freight rates, except those on iron and steel, from 1 to 16 per cent. The railroads claim that the Interstate Commerce Commission will not interfere, and justify the increase on the ground of increased operating costs. According to the provisions of the railroad bill, these increases cannot become effective until their reasonableness is passed upon by the commission.

A Southern Company Reports Good Business.—The Alabama Consolidated Coal & Iron Company, Birmingham, Ala., is preparing to put into commission every available coke oven it possesses, of which 180 have been idle for nine months and 120 for 11 months. The company has just closed a contract for coal and coke sufficient to keep its plants running at maximum capacity for the next 12 months. It has also sold its make of Clifton pig iron up to the first quarter of next year. This should insure a most prosperous year, and at the same time give full guarantee to all labor of steady and profitable employment. It is gratifying that the company has been able to place itself on this enviable footing, as there are perhaps few companies in the district that have been able to protect themselves in like manner.

The Brown & Sharpe Improved Bevel Protractor

An accurate and inexpensive instrument for laying out or establishing angles, alike useful to draftsmen and mechanics, is the improved bevel protractor recently brought out by the Brown & Sharpe Mfg. Company, Providence, R. I. In design it is very simple and similar to the improved universal bevel protractor made by the same company. The main difference is the absence of a vernier on the bevel protractor for making extremely fine measurements. A decided advantage in the use of the protractor is that one side of it is flat, allowing it to be laid flat on the paper or work.

The dial is graduated in degrees over an arc of 180 degrees, reading from zero to 90 degrees from each extremity of the arc. Especial care is taken to make these graduations accurate. The large central stud upon which the dial turns is hardened to minimize wear. When the protractor is set and the nut tightened it clamps the dial rigidly in position, so that there is no danger of slip. The blade is free to move backward and forward for its entire length independently of the dial, which particularly adapts it for work where other protractors cannot be used. It is clamped independently of the dial and is held rigidly in place. Special care has been taken in cutting the grooves, &c., so that there is very little chance for dust to accumulate and cause inaccuracies in the measurements.



An Improved Type of Bevel Protractor Made by the Brown & Sharpe Mfg. Company, Providence, R. I.

The Leesport Furnace Company blew out its furnace at Leesport, Pa., June 22. A good supply of iron is on the banks, which will enable repairs to be made without inconveniencing deliveries on orders.

Unevenly Chilled and Untrue Car Wheels*

A Demonstration of Existing Defects, with a Proposed Method of Correcting Them

BY THOMAS D. WEST.

It is generally known by those familiar with the manufacture and use of chilled car wheels that only a very small percentage of them are evenly chilled. The writer was informed by our highly esteemed late president, Dr. C. B. Dudley, that in the examination of a large number of broken wheels at Altoona, fully 70 per cent. showed variations in the depth of chill. Unfortunately for the railroads, the evenness of chill around wheels is a quality which defies inspection, so that the buyer purchases "a pig in a poke" as far as this point is concerned.

An uneven depth of chill around car wheels is a serious evil. It weakens a wheel just as similar defects weaken chilled rolls, and rolls often snap in two under loads that would have had little effect on them were they chilled to an even depth. The chief cause of this weakness lies in the great difference in strength and contraction of the same iron when in a gray state and in the chilled form.

First, as to the question of strength. Of two casts from the same ladle, the one gray and the other chilled or of an all-white fracture, which means that the carbon is almost entirely in the combined form, the latter generally possesses but little over half the strength of the former. The strength of the white or chilled iron varies according to the class of iron used, that coming from a burnt or oxidized iron being the weakest and that from charcoal iron the strongest. As far as the strength is concerned, therefore, compelling the iron to take the white or chilled form is a necessary evil and often a serious one, especially if the depth of chill is uneven, as it is in the great majority of car wheels cast to-day.

Secondly, in considering the relative contraction of chilled and gray iron cast from the same ladle of metal, we find that the former contracts about as much again as the latter in metals such as Nos. 4 and 5, Table I. The bars used by the writer in making these tests were about 1½ in. square by 24 in. long. Fig. 1 shows the plan of molds used; the sand bars were cast in the space P and the chilled bars in N. The one sand cope covered both molds; each mold had a gate at the center, and both were poured from the same basin.

Table I.—Contraction Tests of Chilled and Gray Iron.
(Test bars, 1½ in. square by 24 in. long.)

Heat No.	Character of metal tested.	Contraction of chilled iron. Inches.	Contraction of gray iron. Inches.
1	Ferrosilicon	0.270	0.240
2	Foundry iron	0.262	0.205
3	Bessemer iron	0.271	0.211
4	Gray iron with 15 per cent. steel	0.322	0.227
5	Charcoal iron	0.446	0.229

If it were not for the fact that the chilled crust of a car wheel or other casting obtains considerable of its contraction before the body of gray iron, which is generally in a liquid state after the chilled crush has solidified, it would be a hazardous undertaking to make any casting having a chilled crust and gray interior. Nevertheless, owing to the difference of contraction mentioned above, there must exist greater internal stresses in a chilled car wheel than if the same casting of gray iron were cooled under normal conditions.

Tests of Wheels for Roundness

The writer is convinced that the present methods of casting are responsible for not only unevenly chilled, but also for untruly round car wheels. Recognizing the importance of tests on the roundness of tread of chilled car wheels, he succeeded in obtaining data upon such tests through the courtesy of S. K. Dickerson, assistant superintendent of motive power, and H. E. Smith, engineer of tests, of the Lake Shore & Michigan Southern Railway Company.

To make these tests six pairs of wheels cast by different founders were selected. An axle with a wheel pressed on each end was placed in a lathe, and the centers were firmly pressed. The wheels were then hand turned. This done, the tread was divided into eight sections, each the same distance from the flat edge, and a specially constructed micrometer used to discover any variation in the roundness. All the testing was done with great care and precision.

The tests are illustrated in Fig. 2. The dotted line

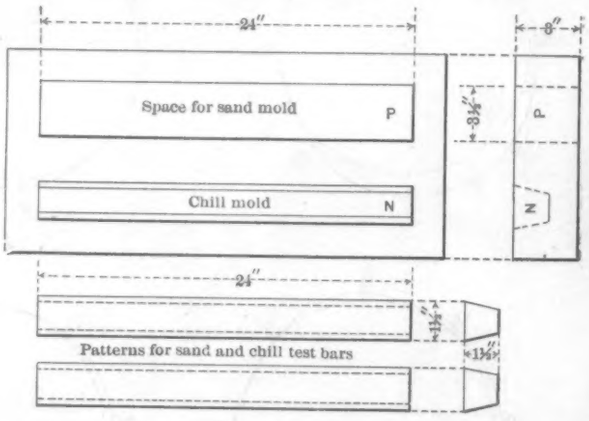


Fig. 1.—Sand and Chill Molds.

in each diagram is a circle through that point on the tread having the smallest radius, and is considered as the datum line. In plotting the diagram the variations from this datum line have been multiplied by five in order to emphasize the irregularity of the tread. It is to be understood, however, that the figures given are the actual variations in the radii of the wheels from the datum circle.

The results of a majority of these tests certainly demonstrate the necessity of improvement in the roundness of wheels as well as obtaining an even depth of chill, and show the importance of testing the roundness of car wheels. The writer is not aware of any regular tests of this kind being made by the railroads, but believes that if they were made with the present make of wheels, only a very small percentage would pass satisfactorily. Such tests could readily and cheaply be made before the wheels are bored by setting an internally turned iron ring over the tread. There are, of course, other plans which could be used, but the ring should answer the purpose in many cases.

While the wheels are undoubtedly weakened by the uneven depth of chill, and have therefore a shorter life, their lack of roundness also prevents smooth running and must cause some vibration or pounding, which greatly aids in creating fractures or breaks in the rails. This pounding effect of flat wheels has been accurately and scientifically demonstrated.

The longer any chilled body remains in contact with the chiller, the deeper chill will it possess. Therefore, any factor which tends to prevent the chilled crust

* A paper read at the meeting of the American Society for Testing Materials, Atlantic City, N. J., June 28, 1910.

from contracting away evenly from the surface of the chiller is a cause of unevenly chilled castings, and also contributes to the making of untrue wheels.

A Method of Securing Even Chill and Roundness

The writer has, after much study, devised a method of casting which will assure evenly chilled and truly round car wheels. (See *The Iron Age*, August 5, 1909.) Since the publication of this article improvements have been made which allow the outer edge of the flange to be of the form now required by the Master Car Builders' specifications. This change permits railroads obtaining wheels cast by this method to meet their specifications for form in every respect.

The thermal and drop tests to which chilled car wheels are now subjected define in a measure what qualifications any special lot of 99 or 98 wheels must possess, but is not the present uncertainty of obtaining an even depth of chill one that might shake faith in the accepted lot? It is essential to know positively just what any method advancing a remedy for these defects will accomplish.

In the past year the writer has done considerable experimenting with his improved method, the results of which have demonstrated the urgent need of having the chilled crust uniformly "hugged" during its contraction. Those familiar with the manufacture of chilled car wheels know that much study has been devoted to obtaining what has now been achieved by the writer, and that several different methods have been tried. These methods depend upon the expansion of short arms which are a solid part of the chiller. To see how far these arms will tightly follow up the contracting shell, the writer presents the test illustrated

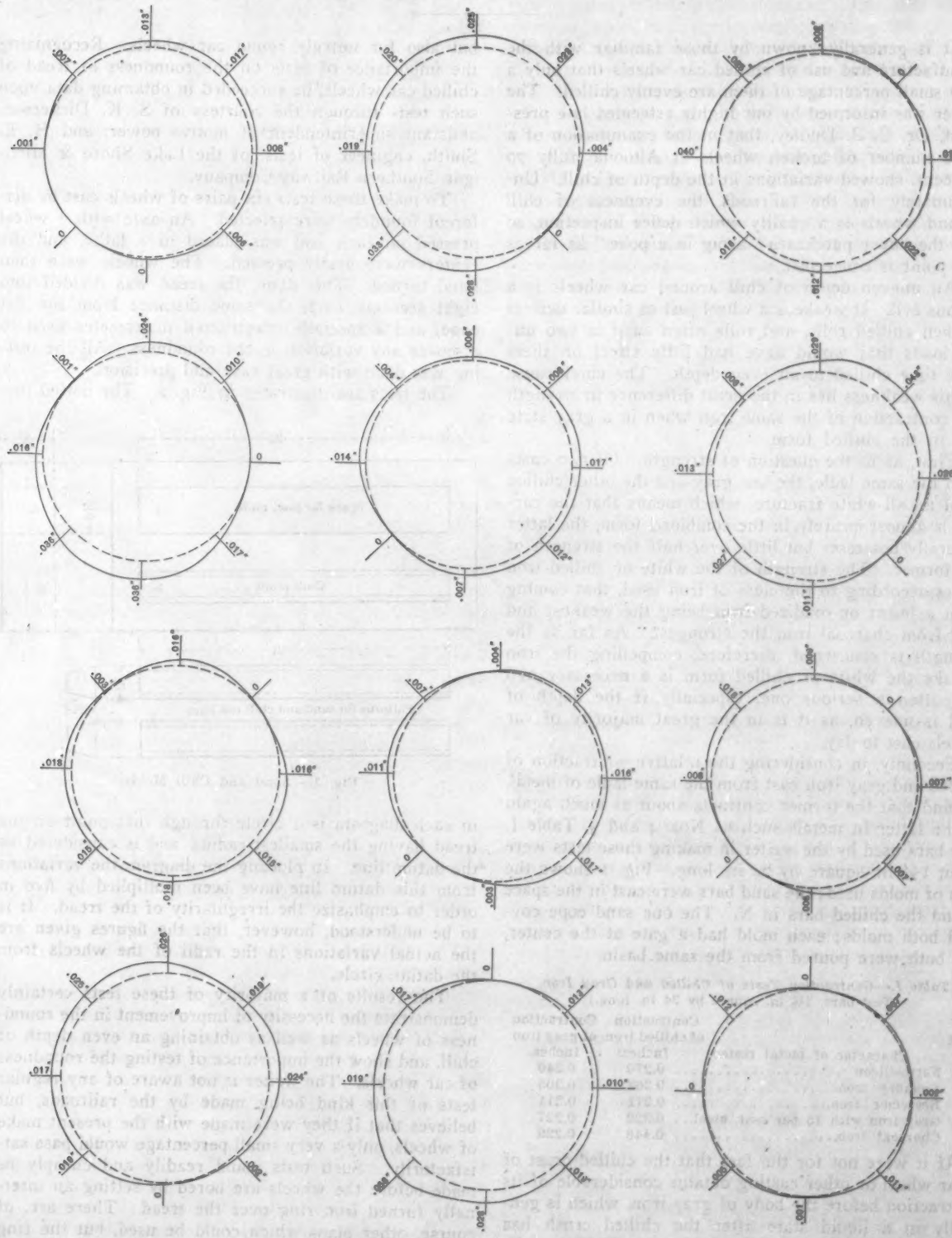


Fig. 2.—Irregularity in the Roundness of Chilled Car Wheels as Illustrated in Six Pairs of Wheels Cast by Different Founders.

by Fig. 3. A 1 x 2 in. wrought iron bar 12 in. long has one end, A, exposed to the heating influence of liquid metal poured into a basin H, 8 in. in diameter by 5 in. deep. The other end, F, is in contact with a 1-in. board K, which is free to swing about the fulcrum M at one end, while the other end just touches a block at D. A test of this device showed that in 5 min. after pouring metal to fill the basin, two fingers could be tightly held on the bar at B, 4 in. from the edge of the basin. It required 10 min. before light could be seen through the opening at D, and 15 min. to note that any heat reached the end at F.

In a study of this test for purposes of comparison, it is to be remembered that the arm or bar A is fully two-thirds the length of those forming a solid part of the so-called compression chiller. Another point to be kept in mind is that any form of arm devised to obtain a tight hugging contact with the contracting crust, as is done in a positive manner with the writer's method, must expand or be forced inward fully 3-16 in.

Another fact which was brought out in these experiments, and one which is known or fully realized by very few if any experienced car wheel makers, is that the chiller will expand about ¼ in. in diameter after pouring the metal. Here we have a movement which is the opposite of contraction and which, in the case of the compression chiller, serves to pull the arms back from the contracting crust more than their expansion can force them inward. This evidently defeats the purpose of having arms tightly hug the contracting crust, which is necessary to obtain an even depth of chill and true roundness in wheels.

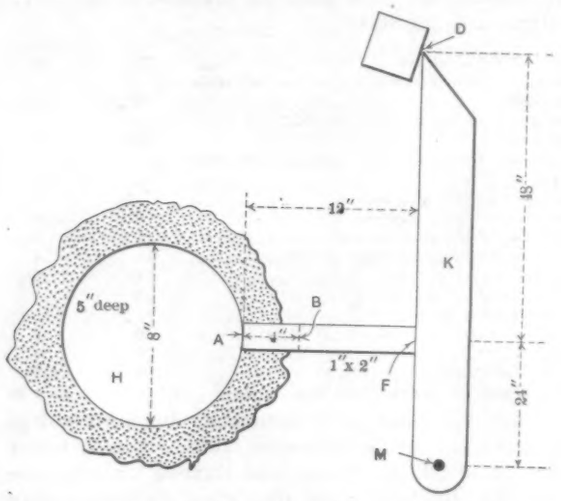


Fig. 3.—Test Showing Expansion of Arms of Compression Chiller.

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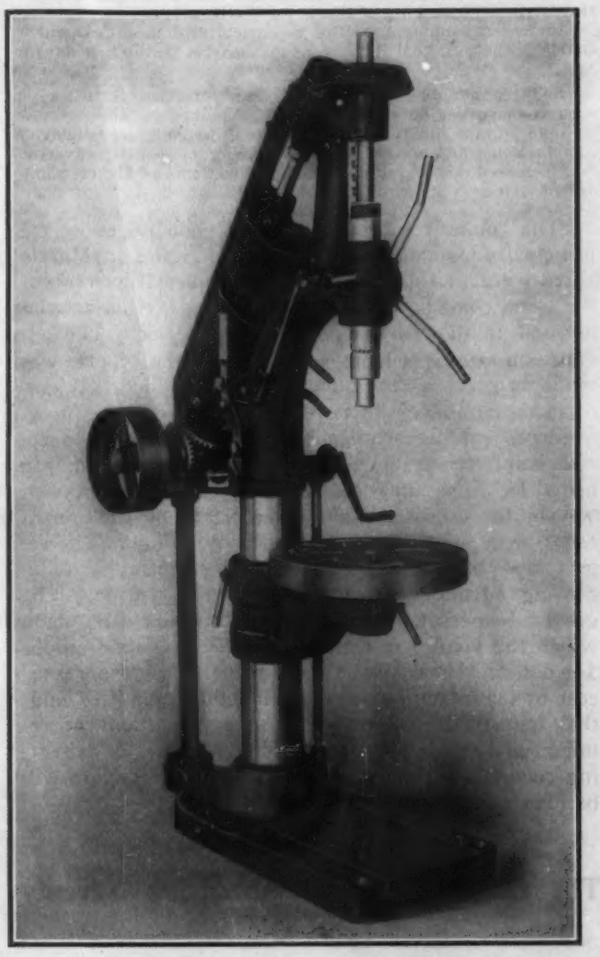

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The frame of this tool is of a new design and the back brace tends to make it very rigid. The spindle is machinery steel and is double splined and ground to size. A ball bearing takes the thrust. The spindle is counterbalanced and the nose extended to bring the drift hole below the sleeve, which has both English and metric graduations. The steel change feed gears are located on the diagonal shafts, running parallel with the back brace. The back gears are operated by a small lever accessible from the front of the drill and may be engaged or disengaged while the machine is running. Convenient means for lubricating both sets of gears are provided. The tool is equipped with a star wheel hand feed lever of the type employed on all of the maker's drills. This operates through a pinion meshing with an internal gear, which is mounted on a cross spindle. In this way the handles of the star wheel are said to be equivalent to an ordinary lever four times as long. This wheel also acts as a quick return lever and eliminates the use of a ball handle for the purpose. The round table shown in the engraving is the one regularly supplied, but a square table with an oil channel can be furnished instead. The table can be swung around on the column and clamped in any position, and a crank operating through miter gears and a screw raises and lowers it.

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	20 in.	24 in.
Hight of drill, inches	70	78
Distance from column to center of table, inches	10¼	12¼
Maximum distance from spindle to table, inches	26⅝	30
Maximum distance from spindle to base, inches	42	44½
Diameter of column, inches	5⅝	6⅝
Diameter of table, inches	16	20
Diameter of spindle, inches	1 7/16	1⅝
Vertical travel of spindle, inches	10	14
Vertical travel of table, inches	16	19⅝
Morse taper of spindle, No.	3	4
Ratio of back gears	4 to 1	4 to 1
Diameter of driving pulleys, inches	10	12
Width of driving pulley face, inches	3	4
Speed, revolutions per minute	400	325
Floor space, exclusive of pulleys, inches	37½ x 16	44 x 20

While the machine is ordinarily supplied with a belt drive, it can be furnished with a geared motor drive, in which the motor and starting rheostat are attached to the back brace just below the point where the pulleys ordinarily are, thus making the entire outfit self-contained.

New Iron Ore and Iron and Steel Samples

The Bureau of Standards, Washington, D. C., is ready to distribute the following analyzed samples:

No. 6a. Iron D, replacing the original D of the American Foundrymen's Association.

No. 24. A vanadium steel with between 0.1 and 0.2 per cent. vanadium. At present only a provisional certificate of analysis can be issued with this steel.

No. 25. A manganese ore, for total manganese and available oxygen.

No. 26. Crescent iron ore [Menominee range], for alumina, lime and magnesia.

No. 27. Sibley iron ore [Vermilion range], for iron, silica and phosphorus.

No. 28. Norrie iron ore [Gogebic range], for manganese (low).

A new schedule of fees goes into effect July 1, 1910, and thereafter the only discount allowed will be 10 per cent. or four or more samples, alike or different. Two new circulars relating to the bureau's standard samples have been prepared for free distribution. Of these Circular 25 contains general information regarding all samples and Circular 26 relates to the methods used by the bureau chemists and many others in analyzing the above manganese and iron ores.

The additions being made to the Oak street foundry of the United Engineering & Foundry Company, Lloyd-Booth department, Youngstown, Ohio, are about completed. All castings will hereafter be turned out in this plant.

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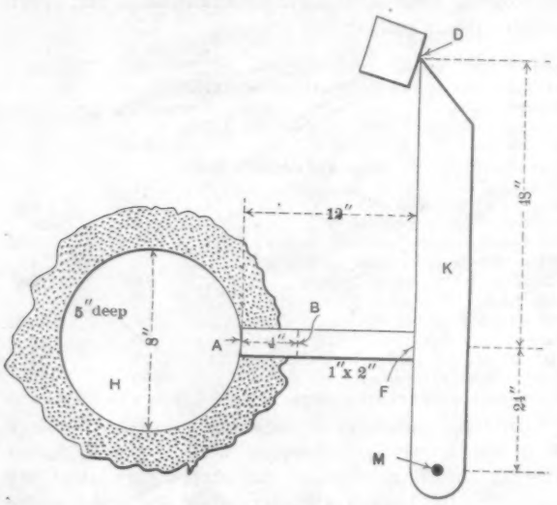

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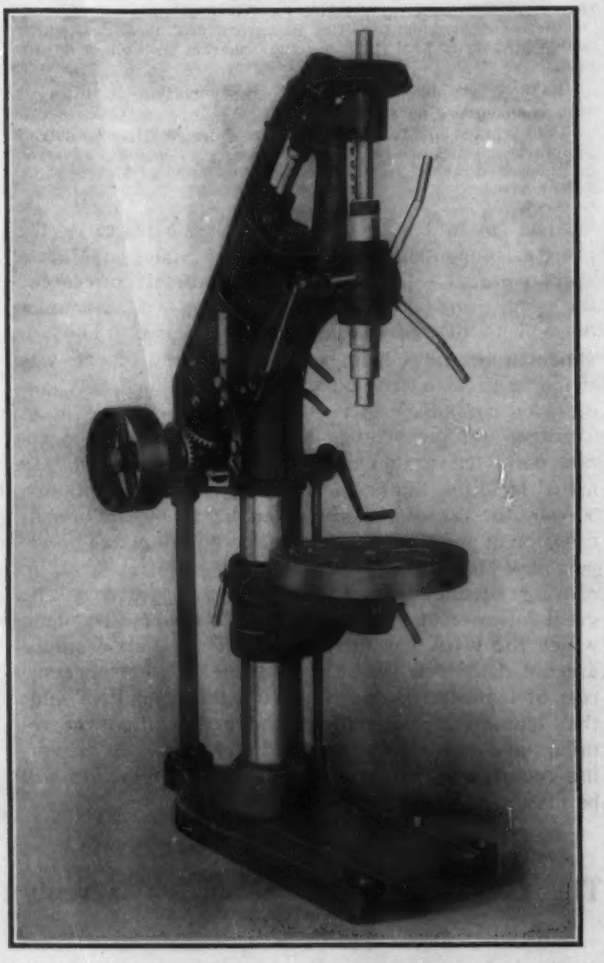

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Maximum distance from spindle to table, inches	20¾	30
Maximum distance from spindle to base, inches	42	44½
Diameter of column, inches	5¾	6¾
Diameter of table, inches	16	20
Diameter of spindle, inches	1 7/16	1¾
Vertical travel of spindle, inches	10	14
Vertical travel of table, inches	16	19¾
Morse taper of spindle, No.	3	4
Ratio of back gears	4 to 1	4 to 1
Diameter of driving pulleys, inches	10	12
Width of driving pulley face, inches	3	4
Speed, revolutions per minute	400	325
Floor space, exclusive of pulleys, inches	37½ x 16	44 x 20

While the machine is ordinarily supplied with a belt drive, it can be furnished with a geared motor drive, in which the motor and starting rheostat are attached to the back brace just below the point where the pulleys ordinarily are, thus making the entire outfit self-contained.

New Iron Ore and Iron and Steel Samples

The Bureau of Standards, Washington, D. C., is ready to distribute the following analyzed samples:

No. 6a. Iron D, replacing the original D of the American Foundrymen's Association.

No. 24. A vanadium steel with between 0.1 and 0.2 per cent. vanadium. At present only a provisional certificate of analysis can be issued with this steel.

No. 25. A manganese ore, for total manganese and available oxygen.

No. 26. Crescent iron ore [Menominee range], for alumina, lime and magnesia.

No. 27. Sibley iron ore [Vermilion range], for iron, silica and phosphorus.

No. 28. Norrie iron ore [Gogebic range], for manganese (low).

A new schedule of fees goes into effect July 1, 1910, and thereafter the only discount allowed will be 10 per cent. or four or more samples, alike or different. Two new circulars relating to the bureau's standard samples have been prepared for free distribution. Of these Circular 25 contains general information regarding all samples and Circular 26 relates to the methods used by the bureau chemists and many others in analyzing the above manganese and iron ores.

The additions being made to the Oak street foundry of the United Engineering & Foundry Company, Lloyd-Booth department, Youngstown, Ohio, are about completed. All castings will hereafter be turned out in this plant.

New Tools and Appliances

New Friction Clutch.—A positive drive friction clutch, which combines the principles of both a friction and a positive clutch and is made in a number of sizes, is being placed on the market by the F. C. Sanford Mfg. Company, Bridgeport, Conn. The friction portion of the clutch is operated by the expansion of a split ring which is dependent upon the moving in or out of the shipper ring. As the speed of the clutch increases two dogs are thrown outward by centrifugal force so as to intercept a stationary pin on the opposite diameter of the shipper ring. This positively locks the clutch with little or no shock and it will remain a positive locked clutch until the shipper ring is drawn backward, removing the pin and allowing the dogs to drop back into place as soon as the speed is reduced. In this design the maximum capacity for driving is the shearing strength of either the dog or the pin instead of the power of the friction surfaces. Any increase in the load cannot produce slipping, and as the work of the friction surfaces is confined to starting and getting up to speed the life of the clutch is lengthened.

Portable Cutter Grinder.—The H. C. Williamson Engineering Company, Indianapolis, Ind., has built a self-contained grinder for grinding milling cutters in place on the spindle. A 6-in. cup wheel is mounted on the shaft of the motor, which is driven from an electric lighting circuit. The motor is mounted on a plate which has a fixed angle to give the teeth the proper clearance. This plate is attached to a slide which travels in the arc of a circle to present the wheel to the teeth at the proper angle. Two adjustable stops limit the amount of this travel, and to insure uniform grinding, the lever carrying the wheel up to the tooth is provided with a stop.

Perforated Steel Belts.—The Brown Spin-Wright Construction Company, New York City, has brought out a series of perforated steel belts designed for running over sprocket wheels. These belts are perforated to engage a series of sprockets which form the driving and driven pulleys. In operation the belt passes around these sprockets and under an idler. These belts, it is stated, can be used on any size of pulley without any slip.

Double Head Traverse Drill.—A new double head traverse drill is being manufactured by the National Machine Company, Hartford, Conn., which is equipped with hand feed instead of the automatic type furnished with the older model. Both spindles are fed at equal speeds by a four-arm hand wheel that controls them in all positions of the heads, which can be varied along the bed so as to give a maximum distance between the spindles of 20 in.

Inserted Tooth Milling Saw.—The Huther Bros. Company, Rochester, N. Y., has developed an inserted tooth milling saw for cutting steels which are hard and tough. The saw is constructed of two plates riveted together, with the tooth pockets cut alternately in both plates. The teeth are inserted in these pockets and securely riveted to the opposite plate. In this way new teeth can be inserted whenever they become worn and the saw possesses the important advantage of cutting with less strain and requiring less power than a thicker one.

Steel Rule With Decimal Equivalents.—The Lufkin Rule Company, Saginaw, Mich., has brought out a rule which has a table of decimal equivalents on its face as well as the regular graduations. One side has a 6-in. scale with the first inch graduated in sixty-fourths and the remainder in thirty-seconds, and also the decimal equivalents of all the fractional parts of an inch by sixty-fourths. The other has the decimal equivalents of the customary wire gauges and a 6-in. scale graduated in sixteenths.

Turret Lathe Chuck.—The Pratt Chuck Company, Frankfort, N. Y., is now manufacturing a chuck which has been especially designed for use in turret lathes and the turret heads of screw machines, for holding tools such as drills, outside finishing tools and reamers. The maker's patented equalizing driver, which is self-adjusting and aligns the tool shank accurately and holds it firmly, is furnished. For finishing cuts the tool can be allowed to float by partially tightening the jaws, as this driver will prevent it from turning. A number of sizes ranging from 2¼ to 6¾ in. in diameter and having drill capacities from ½ to 2 in. are made.

Toolmakers' Scrapers.—The J. E. Poorman Company, Inc., Philadelphia, Pa., has brought out a set of scrapers designed for the use of toolmakers who desire something neater than a file for scraping. These tools, which are made in a variety of styles, will be found useful in connection with vise work, metal pattern making and like work.

Combined Threading, Tapping and Cutting-off Machine.—A recent product of the Wiley & Russell Mfg. Company, Greenfield, Mass., is a combined bolt cutter, nut tapper, pipe threader and cutting-off machine, which is especially adapted to railroad shops. A special type of work-holding chuck with interlocking and interchangeable jaws which will hold either round or square stock, is provided. The spindle is hollow so that any length of pipe or bolt can be handled. The die heads are supported in frames mounted on the carriage of the machine and are kept from turning by a spring pin. In using the machine for nut tapping, it is only necessary to clamp the tap in the chuck and place the nut in the jaws between the carriers supporting the die heads. The cutting-off attachment, which can be swung back out of the way when not in use, consists of a small carriage with a tool post and a hand-operated cross feed.

Kerosene Blow Torch.—The Hauck Mfg. Company, 140 Cedar street, New York, is making a new type of blow torch in which kerosene is employed as fuel instead of gasoline, for brazing cup joints. Better results are said to be obtained than are possible with gasoline and the flame is intense and clear, possessing enough heat to melt a 1-in. rod in 2 min. These torches are simple and strong and are built in a number of sizes.

Three-Way Vise.—An interesting and useful tool having a universal application on the milling machine is the Aetna three-way vise, built by the Becker Milling Machine Company, Hyde Park, Mass. Adjustments in three planes are provided so that the vise can be set to practically any position and each adjustment is independent of any other. The first of these adjustments is in a horizontal plane and enables the work to be rotated through a complete circle, while the second is at right angles to the plane of the first and allows an adjustment from the horizontal to the vertical plane through an arc of 90 degrees, and the third is fixed at right angles to the plane of the second regardless of what it may be in any case, and rotates the work through a complete circle. This device is secured to the milling machine table by two bolts and the work can be clamped in any position without disturbing these bolts.

Universal Rail Frog.—The Indianapolis Switch & Frog Company, Springfield, Ohio, has added a new feature to its line of manganese solid frogs, crossings and switch points which is a universal type of frog adaptable for all railroad companies. It enables them to carry regular sizes and numbers of these frogs in stock for various weights of rails.

Combination Bench Anvil.—A combination bench anvil has been brought out by the Cascade Tool Company, Cohoes, N. Y., which consists of a tubular base or stand and an interchangeable disk and anvil. The former has a center hole and a series of others ranging in diameter from ¼ to 1 in., so that when it is revolved, various sizes of holes are brought into alignment with the bore in the base for driving arbors and pins. Either side of the disk can be used for work, as both are ground. When it is not required, it can be lifted off and replaced by the anvil, and makes an excellent bench block.

Bench Shear and Rod Cutter.—The Merwin Mfg. Company, Erie, Pa., has placed on the market a bench shear to which the name Vulcan has been given. The blades are adjustable and interchangeable and are made of ¼-in. tool steel 4 in. long. The opening at the point is 1¼ in. The rod cutting attachment consists of a cylindrical steel die placed in each arm and provided with

round openings which are in line when the jaws are opened. An adjustable gauge enables a number of pieces to be cut to the same length. The maximum capacity of the rod cutter is ⅝-in. wire or rods and of the shear, cold rolled steel pieces 3-16 in. thick and 2 in. wide.

Wheel Puller.—M. E. Kerschbaum, 103 Chambers street, New York, is placing on the market a wheel puller which is made in two sizes. The smaller one is provided with two arms and will stand a strain of 6 tons, and the larger has three arms spaced at equal distances and will stand a strain of 10 tons. The device is of drop-forged high-carbon steel, and a set of arms provided with hooks at the ends is supplied. A set of extension arms which doubles the reach of the larger size is also furnished.

Compact Angle Drill.—Lowndes & Butler, Norristown, Pa., are making an angle drill capable of being used to advantage in many places in almost any shop which permits holes to be drilled by power in close corers where a ratchet is generally considered necessary. All sizes for accommodating drills from 9-16 to 2 in. in diameter are made. The length of body in the smallest size is 2⅞ in. and that of the largest 5⅛ in., the weight varying from 2¼ to 10 lb.

Chambered Hole Reaming Machine.—It is practically impossible to get the two ends of a chambered hole to line up and ream in a lathe or a drill press, even though a floating reamer is employed, and in order to overcome this difficulty the Hoefer Mfg. Company, 118 Jackson street, Freeport, Ill., has built a special type of reaming machine. The spindle points upward and holds the reamer arbor shank upon which an adjustable shell reamer is placed. Just above the reamer at the upper end of the arbor is a small pilot which enters into the guiding arbor above it, which is held in the nonrotating spindle carried by the column. In operation this upper spindle of the guiding arbor is raised and the work slid on to the arbor. The spindle is then lowered until the guiding arbor gauges with the pilot and the machine is started. As the lower spindle rotates the operator exerts slight pressure on the work, feeding it over the reamer until the latter comes through at the top. The work for which this machine is especially suited is reaming spindle sleeves, pulleys and the holes of gears.

Melting and Refining Furnace.—A reverberatory melting and refining furnace which is designed to use liquid or gaseous fuel has been developed by the W. S. Rockwell Company, 50 Church street, New York City. When oil or gas is used for fuel a stack is not required, as the hood placed over the furnace is sufficient to carry off the gases and fumes of the metal. Coal or coke can be used as fuel, but if this is done a flue must be constructed from the top of the furnace to a stack. These furnaces are designed for reducing borings, turnings and miscellaneous scrap to ingots, melting and refining drosses, running down copper and brass wire into ingots, and making metal for heavy brass and bronze castings, and are built in a number of sizes with capacities ranging from 1000 to 30,000 lb.

New 14-In. Engine Lathe.—The Young Machine & Tool Company, Worcester, Mass., has just brought out a new 14-in. engine lathe swinging 16 in. over the bed and 11 in. over the carriage. Arrangements are made so that it is impossible to throw both the rod and screw feed in simultaneously. All the bearings are hand scraped cast iron. Gear cutting and taper attachments are not supplied regularly with the lathe, but can be had at slight extra cost.

Automatic Duplex Squeezer.—E. Killing's Molding Machine Works, Davenport, Iowa, has built an automatic squeezer which rams both the cope and the drag. The machine accomplishes nearly all of the molding operations so that practically all the operator has to do is to supply it with sand and remove the completed molds. A pneumatic sand sifter riddles the sand on the pattern and the cope and drag are squeezed in one operation. The closing of the mold and the vibration of the pattern are both controlled automatically.

Exhaust Steam Turbine.—The Kerr Turbine Company, Wellsville, N. Y., has developed an exhaust steam turbine designed for driving generators, centrifugal pumps, fans and other high speed machinery by the utilization of the exhaust from reciprocating engines, pumps and air compressors. It is stated that generally the steam economy of this combination is considerably better than that which would be obtained by compounding and adding a condenser and the plant capacity is increased from 50 to 100 per cent. by putting an exhaust turbine and condenser on a noncondensing engine, while the increase secured by adding the turbine to a condensing engine is from 1½ to 3 times that which could be secured from the condenser alone.

Motion Sample Boards.—J. H. Williams & Co., Brooklyn, N. Y., manufacturers of drop forgings and wrenches of various kinds, have adopted an ingenious plan for displaying wrenches at convention exhibits and in store windows. By the use of what they have termed "motion sample boards," they show the action of various wrenches by means of mechanism which operates the wrenches after the manner of their use in the hands of a workman. Along with the moving exhibits on other parts of the board are mounted unassembled wrenches and other specialties in the way of drop forgings made by this firm. The principal devices shown in action are Ratchetless Ratchet Wrench.

Pipe Threading Machine.—The Threading Machine Company, Sandusky, Ohio, is getting out a new pipe threading machine. It will be a hand machine, designated as No. 0 for threading ¾-in. pipe and smaller. This company is also remodeling its No. 2 and No. 3 pipe threading machines. Several improvements will be made and power attachments will be added.

Sliding Bed Gap Lathe.—The Rahn-Carpenter Company, Cincinnati, Ohio, has redesigned one of its late products, a 24-40 in. sliding bed gap lathe to meet the demand for a standard swing tool of this character in large repair and jobbing shops. The new lathe is 24-48 in., the depth of the sliding bed is 12 in., the depth of the lower bed, 12½ in., and the length of the carriage, 31 in. The weight of the 10-ft. lathe is 7000 lb., and 625 lb. more for each additional 2 ft. of bed length. The company has enlarged its operating capacity to include a subsidiary plant in another city, where the new lathe will be manufactured, and has also recently arranged for agency representation in England, Switzerland, France, Italy and other European countries.

Power Bench Press.—A medium weight bench press, whose special feature is a one-revolution positive stop clutch, is being manufactured by the Atlas Machine Company, Waterbury, Conn. The clutch is operated in the customary way by a foot treadle and is released by a cam point striking a knuckle piece. The movement of the latter slightly raises the pull-down latch and at the same time pushes off and releases the clutch lever which engages the driving key, and this in turn pulls out and stops against a projection at the end of the up-stroke. If it is desired to arrange the press for continuous running, it is simply necessary to loosen a nut and drop the knuckle piece. The stroke is 1½ to 2 in. and the die bed 8 x 13 in. The weight is 375 lb.

Automatic Cotter Pin Machine.—The F. B. Shuster Company, New Haven, Conn., has built a machine for forming round keys ranging from ⅜ to ⅝ in. in diameter and flat keys whose width does not exceed 1½ in., the length in either case being anywhere from 1½ to 7 in. Care was taken in designing the machine to leave all the principal working parts exposed so that the tools might be adjusted readily. The speed at which the pins are formed is in proportion to the length of the piece and is regulated by a three-step cone pulley.

A Special Multi-Spindle Drilling Machine.—The Buckeye Machine Tool Company, Cleveland, Ohio, has made a special five-spindle drilling machine particularly designed for drilling small cross holes in the ends of bolts, studs, rivets, or similar pieces for the insertion of cotter pins or other retaining devices. The pieces to be drilled are clamped one after the other in the clamping jaws which hold them so that the hole will be drilled centrally and at the proper distance from the end of the bolt. The feed is automatic and any desired rate can be obtained.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.90¢
1½ to 4 in. x ¼ to 5-16	₩ lb 2.10¢
Rods—¾ and 11-16 round and square	₩ lb 2.10¢

Angles: Cts ₩ lb

3 in. x ¼ in. and larger	2.10¢
3 in. x 3-16 in. and ½ in.	2.35¢
1½ to 2½ in. x ¼ in.	.0¢
1½ to 2¾ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.10¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ¼ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.55¢
½ x 3-32 in.	4.35¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.20¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 12 @14½¢

Patent Planished, W. Dewees Wood. ₩ lb A, 10¢; B, 9¢ net

Galvanized.

Nos. 14 to 16	₩ lb, 3.20¢
Nos. 22 to 24	₩ lb, 3.55¢
No. 26	₩ lb, 3.75¢
No. 28	₩ lb, 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb ..5.75¢
No. 26	₩ lb ..6.25¢
No. 28	₩ lb ..7.25¢

Corrugated Roofing—

	Painted	Galvd
2½ in. corrugated, No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.85	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 34¼@35¢

Copper—

Lake Ingot	₩ lb 14¾@15 ¢
Electrolytic	₩ lb 14¾@15 ¢
Casting	₩ lb 14¼@14½¢

Spelter—

Western ₩ lb 6¼@6½¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8½¢

Lead.

American Pig	₩ lb 5 @5¼¢
Bar	₩ lb 6¼@6½¢

Solder.

½ & ½, guaranteed	₩ lb 22 @22½¢
No. 1	₩ lb 19 @19½¢
Refined	₩ lb 17½@17½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb ..@10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.25@10.50
Copper, Heavy and Wire	₩ lb 10.00@10.25
Copper, Light and Bottoms	₩ lb 9.00@ 9.25
Brass, Heavy	₩ lb 6.75@ 7.00
Brass, Light	₩ lb 5.50@ 5.75
Heavy Mechine Composition	₩ lb 9.25@ 9.50
Clean Brass Turnings	₩ lb 6.75@ 7.00
Composition Turnings	₩ lb 8.00@ 8.25
Lead, Heavy	₩ lb .....@ 3.50
Lead, Tea	₩ lb .....@ 3.25
Zinc Scrap	₩ lb .....@ 3.75

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